# NATURE MAGAZINE

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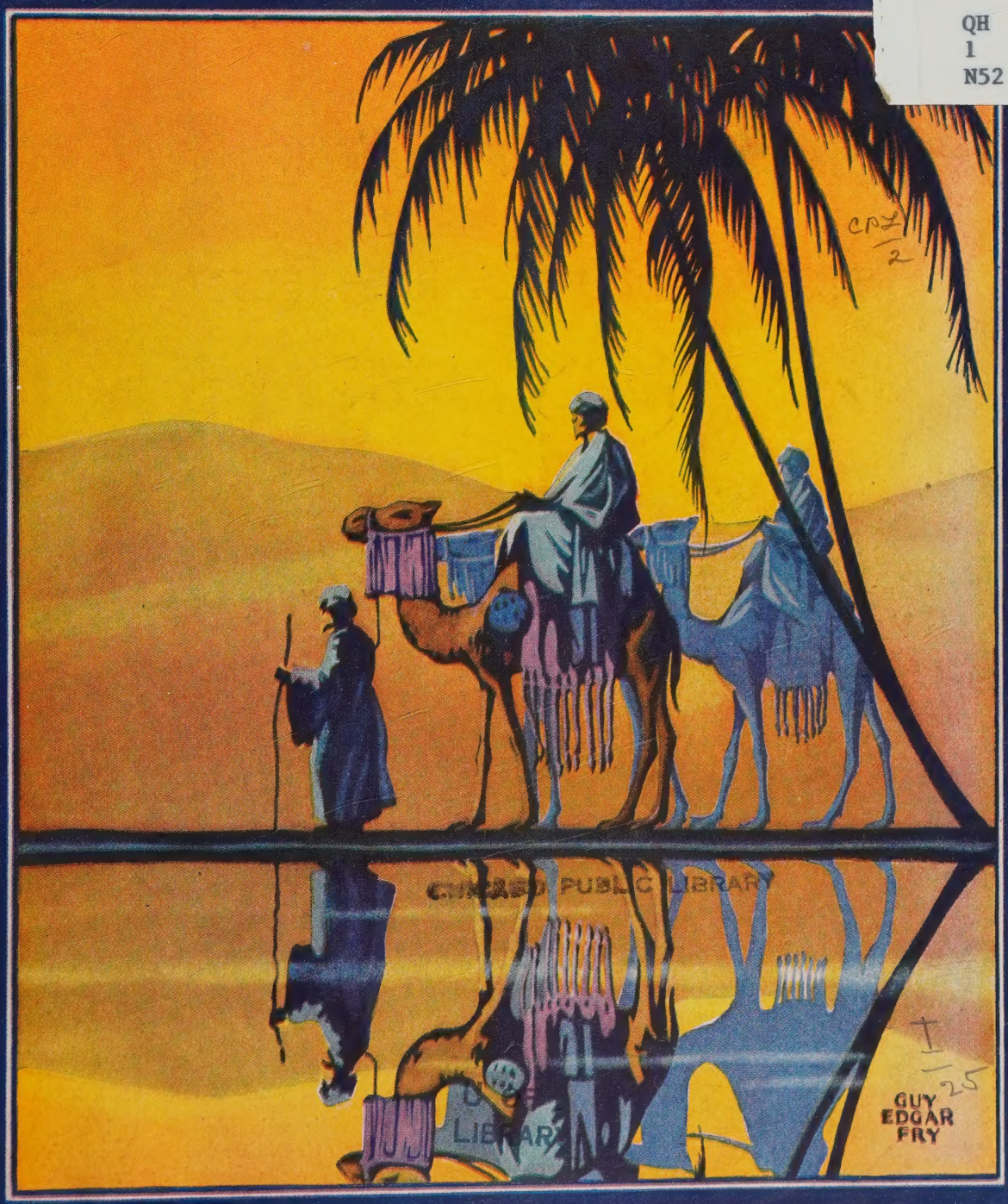


JANUARY 1930 35¢ VOL. 15, NO. 1

Greetings of the Season
Christmas Joys be yours
Wishing you a very Merry Christmas and a Happy New Year
A hearty rush in a Cheery way for the Merriest kind of a Christmas Day
Merry Christmas

# Beautiful Christmas Cards

## NOW READY FOR MAILING

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My check for $..... is enclosed.

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**Each month this page will be published in NATURE MAGAZINE. On it will be listed books in two classifications. The first group includes those volumes of current publication regarded by the most competent authorities, consultants of this Association, as outstanding and valuable. The second group includes those books in various fields which are regarded as somewhat standard works and yet are still available from the publishers.**

**Consider these lists of books, your own particular interests in Nature and your present library, and add an excellent Nature book each month. Send the listed price (which includes postage) of the volume to:**

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40174

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*Address*.....

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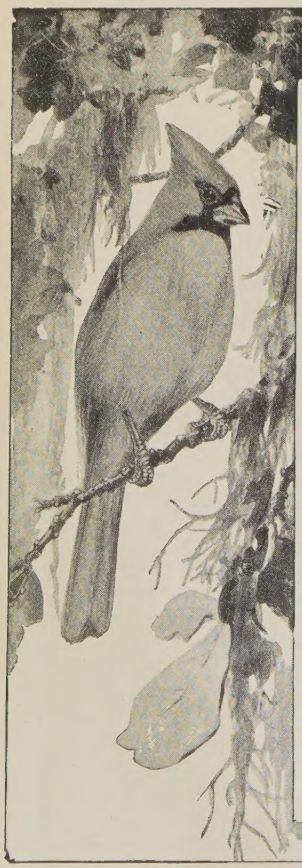

## Membership Nomination Blank

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WASHINGTON, D. C.

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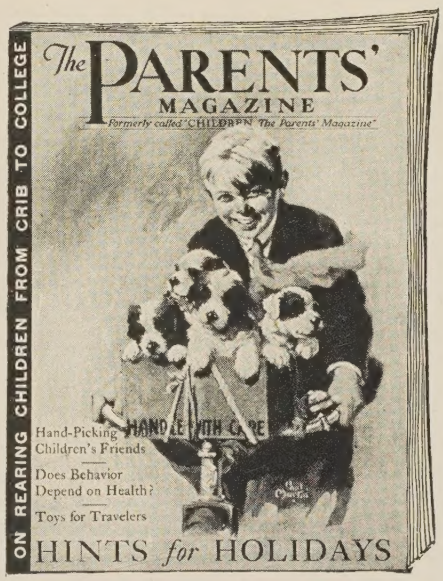
ON REARING CHILDREN FROM CRIB TO COLLEGE
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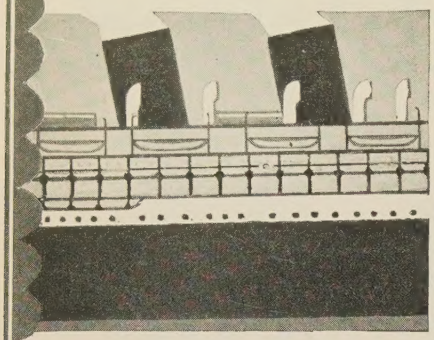

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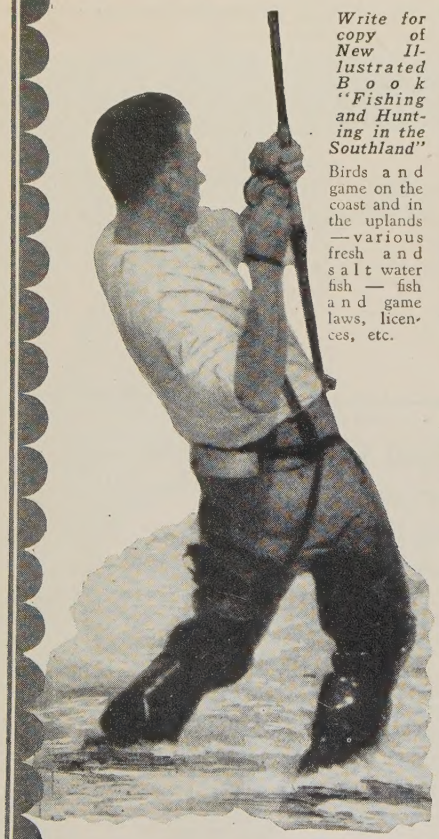

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Birds and game on the coast and in the uplands—various fresh and salt water fish — fish and game laws, licences, etc.

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AGWI LINES

The days following Christmas are marked mainly by a scurry of travelling, North and South, East and West. A large share of it will be to Europe, for as a winter resort this is growing in favor. In prospect of a busy season, all the leading steamship lines have their best boats ready at the tape to dash across with the beginning of the New Year.

* * *

The White Star Liner *Olympic* makes a trip from New York to Southampton on the eleventh and the thirty-first, and the *Megantic* and *Arabic* of the same line depart for Liverpool on the fourth and eleventh, respectively. The Red Star line, from New York to Plymouth, Cherbourg and Antwerp, has sailings on the fourth and eleventh. The same dates are also selected by the Atlantic Transport line, from New York to London, for the weighing of anchor of the *Minnetonka* and the *Minnekahda*. Europe is much more pleasant in winter than in summer, if only to escape the crowds, and to travel about with that leisure which the more travelled months cannot offer.

* * *

Among the 'round-the-world cruisers, the *Belgenland,* of the Red Star line, departs from New York on December 20, and leaves Los Angeles on January 5, bound for Hawaiian Islands, Japan, China, the Philippines, Siam, Java, India, Ceylon, Egypt, Greece and Europe. Among the most interesting ports it will touch will be Colombo, the capital of Ceylon. Here, one will find a true Conrad setting, and can easily imagine he sees Lord Jim, or that any one of the passing negroes is the "Nigger of the *Narcissus*". Here are the same sort of sea outcasts of which Conrad wrote, the same type of ships, the same indolent air of the East, the same touches of life more or less burned by a tropic sun. Yet perfect appointments in the hotels, and excellent entertainment at all times, as is characteristic of the Red Star cruises.

* * *

Among the many other desirable cruises offered by nearly every steamship line are the Mediterranean tours of the White Star company. The *Laurentic* departs on January 9, and again on February 27 from New York: the *Adriatic,* which calls at Boston, leaves on January 18. Madeira . . . Gibraltar . . . Algiers . . . Naples . . . Constantinople . . . Alexandria . . . Syracuse . . . there will be no end of beauty to be breathed in and life to study amid the scenes found along the way. Or one can take the *Homeric* on January 25, and cover the country somewhat more elaborately, thus still further seeping up what the world has to offer.

* * *

The beckoning East can become more convincing to those who wish the advantages of civilization when they travel as a result of the offerings of the Anglo-American Nile and Tourist Company, which is running 20-day tours up the historic Nile to the first cataract, past Beni-Hassan,


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One of America's foremost resort hotels . . . . facing glorious Tampa Bay . . . . sun bathing and every recreational feature.
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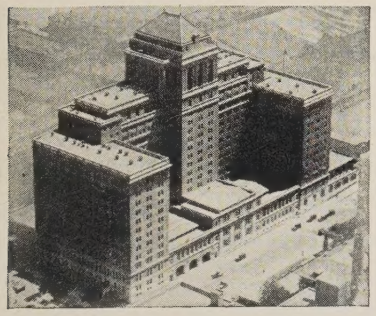
IT IS a fresh and comfortable beauty — this of new Haddon Hall. Everything is here to delight your eye and your sense of comfort. Sports rooms, squash courts, gymnasium, sun-bathing rooms, Sandy Cove, a playroom for the children—and bedrooms of beautiful decorative schemes, the results of unstinted planning. Ocean breezes blow in through open windows, and out the windows there's the broad ocean view.

Relax and feel at home here. Both riding and golfing facilities. Write for rates and literature. A Motoramp garage adjoins the hotel.



## CHALFONTE-HADDON HALL

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Assuit, the famous temples of Seti and Rameses, Thebes, Luxor and hundreds of other historic places. To travel along the fringe of the Libyan Desert, to watch native boys shoot the rapids at the First Cataract on logs, to visit the old ruins, symbols of a vanished civilization, is to gain new impressions of the world. Shorter tours are offered, while special parties can be completely equipped and guided to other places. The American Express Company is the general agent handling these excursions.

* * *

The Royal Mail Steam Packet Company, New York, announce that the *Arcadian,* a 19,400-ton oil burner, is to replace the *Avon* on the New York-Bermuda sailings. One of the bigger and better boats, her first sailing will bring her into Bermuda for Christmas, while the second, on December 27, arrives before New Year's. This same line offers a series of 14-day winter cruises to the West Indies for $140, on the steamer *Araguaya.*

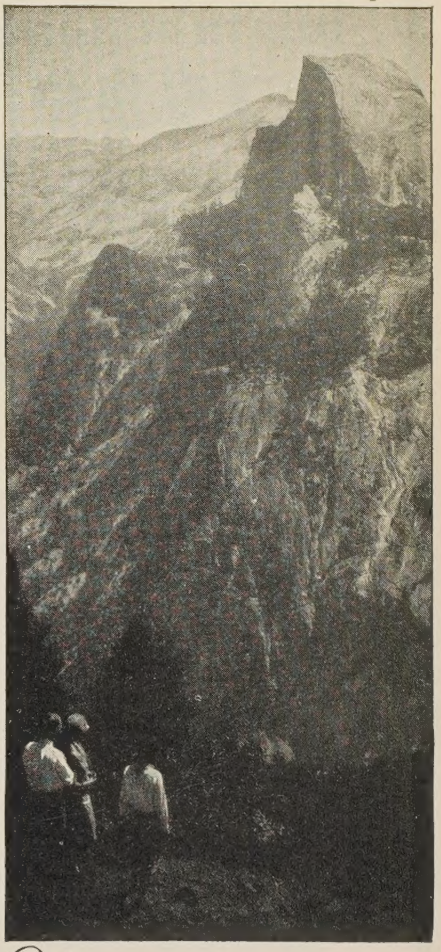
* * *

Florida and North Carolina in the East probably draw the greatest number of Americans during the colder months, and just now all the southern railroads are crowded to capacity. Their motto seems to be: "Get them all out of New England by Christmas." Bookings to Florida, the Seaboard Air Line Railway reports, were heavier than in previous years. The trains of the Southern Railway, whose fleet is one of the largest, are likewise well-filled. Among the crack Southern Railway flyers is the Royal Palm deLuxe, with sleeping cars from Chicago, Indianapolis, Grand Rapids, Detroit, Toledo, Buffalo, and Cleveland, all Miami-bound. Its rival probably is the Ponce deLeon, while the Skyland Special, running from Cincinnati to Jacksonville through Asheville in the "land of the sky" will probably tempt those choosing the more scenic routes. The Southern Railway has in addition several trains from the West, such as the Kansas City-Florida Special. From New York runs the ever-popular Aiken-Augusta Special, which takes in both Aiken and Augusta, both favorite wintering places.

* * *

Growing interest in winter sports may cut down some of the southern migration in the next few years, and the North come into its own as a resort. Any who have felt the thrill of pitching down a steep slope on skis, or swirling over the ice on skates, or doing a double dip with a toboggan will forever after find the life on the beach or on the hotel verandah—yes, and even on the golf-links,—uninspiring. The zest for living which comes from a snowshoe tramp followed by a beef-steak dinner before an open log fire in some secluded, snow-banked cabin is never aroused to such a pitch by other lines of endeavor. More people each year are finding this out. The Adirondacks, the White Mountains, the Berkshires in the East, and the Rockies and Cascades in the West gain each year new friends who like them snow-capped better than bare.


## OVERNIGHT from San Francisco or Los Angeles



*You turn the page 600,000 years....*

Take the Sierra's towering granite peaks, world-famed waterfalls, and an eight-mile meadow floor . . . cluster them in a pattern that will remain the marvel of ages, and you have Yosemite's valley of giants!

It is yours to see . . . even to *live* in, economically . . . on each California trip.

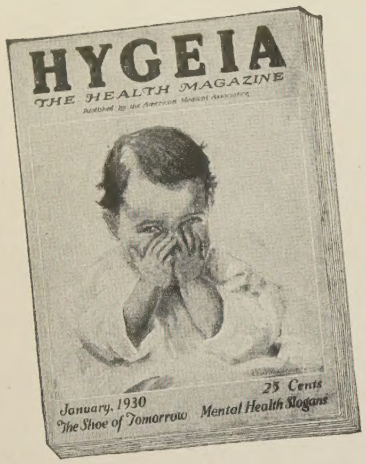
In winter, a week-long holiday of fascinating outdoor sports . . . in spring and summer, the horseback, motor and hiking tours up into lordly High Sierra . . . in autumn, the thrill of Indian Field Days, and sunshiny rambles along the russet-glowing trails. *All year* you play!

Do you want fine living? It's here, in the colorful Ahwahnee, California's most distinctive resort hotel. Rates from $10 a day, American Plan. Other all-year accommodations from $1.50, European.

Merced, California, is your mainline stopover point . . . all-expense tours, from $30 to $76.25, cover 2 to 4 days in Yosemite. Ask any travel agent to plan a stopover. Folders from Dept. 130, Yosemite Park and Curry Co., Yosemite National Park, Calif.

## YOSEMITE & MARIPOSA BIG TREES

# What Is Your HEALTH OUTLOOK for 1930




**In a large measure your health depends upon yourself. It is not enough to be alarmed when something goes wrong with your physical machinery; your concern about your health should begin earlier than that.**

Knowledge of fundamental health facts is your protection against disease. Accurate information on the vital things that aid in building better health and stronger reserve against disease is brought to you in HYGEIA, the health magazine of the American Medical Association.

The best specialists in the various medical fields contribute each month to HYGEIA valuable information on pertinent health subjects.

*HYGEIA will prove a real benefit to you in your health program for 1930*

## *Coming in January:*

**"Making Your Heart Write"**—"As individual as your photograph" is your heart writing as recorded by the electrocardiograph. This perfected "heart writer" and its importance in understanding the heart is explained in this unusual article.

**"CITY SMOKE"—A Necessary Incense to Gods of Prosperity?**—Of more than passing interest is this subject which deals with the smoke evil in manufacturing cities of the United States. The author tells of the progress made in abating the smoke pall which hovers over our industrial centers. Extraordinary photographs add much to this article.

**PLUS THESE FEATURES**

The schedule for January HYGEIA includes in addition to these two features a wide diversion of health topics: *"Neuritis," "Mental Health Slogans," "The Shoe of Tomorrow," "Rhinitis or Nasal Catarrh," "A Mouse That Waltzed Himself into a Job," "Big Medicine,"* part two; *"Who Says So?,"* part two; *"Health Exams at College," "Simple Lessons in Human Anatomy," "Making Worthy Use of Leisure," "Donald the Strong,"* editorials, etc.

**To New Readers**

**6 MONTHS FOR $1.00**

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*Enclosed find $1.00 for which send me HYGEIA six months in accordance with your special introductory offer.*

*Name* _____

*Address* _____

MOVIE cameras were a part of the equipment of members of Nature Magazine parties in Glacier National Park last summer. There were instances, however, when weather or opportunity did not permit getting certain shots and these had to be passed up. The Bell and Howell Company now announces a group of National Park films in the 16mm size which may include shots you missed in one or another of the National Parks. In any event they will supplement your vacation reels. The Parks covered are Yellowstone, Glacier, Yosemite, Grand Canyon, Bryce and Zion.

* * *

Speaking of National Parks, Russell T. Neville, who has contributed to the pages of Nature Magazine, is now lecturing with some remarkable motion pictures taken in Carlsbad Cavern. Mr. Neville is a lawyer of Kewanee, Illinois, but has a flair for caves. He has penetrated caves in his own immediate region, where there are many, and some of his resulting pictures were reproduced in these pages. Taking a DeVry Standard Movie Camera into Carlsbad, Mr. Neville and his daughter, Julia, sought places inaccessible to the public with startling movie results. If you hear of Mr. Neville lecturing, don't miss some remarkable cave movies.

* * *

It's simple but it's good, describes the little idea in the Bell and Howell humidor cans which tells you when the moistening blotter is wet enough. There is a solid circle in the center the same color as a dry blotter. Wet the blotter and it changes to a darker blue, fading out to the color of the center and key circle as it dries. That's really helpful.

* * *

This is the season when those who can seek the tropics or the warmer climes for a bit and Mr. E. J. Butchart, writing of a trip in the Caribbean Islands in the excellent *American Photography*, gives some good advice to the visitor to the tropics who carries along a camera. He writes:

"Most amateur photographers are equipped with folding cameras of the roll-film variety. The most popular size is undoubtedly the 3A or postal card. Films for this size can be obtained in almost every town of any size throughout the islands. The vest pocket sizes, 1⅝ x 2½ inches and 2¼ x 3¼ inches run a close second.

"Due to the climate it is not safe to trust to films brought from the north, unless they are absolutely fresh and put up by the manufacturers in hermetically sealed tin or lead containers. However, the best known makes of films can be obtained throughout the islands at prices but little in advance of those bought in the north.

"Film packs of all sizes can be bought in the larger cities, but if the tourist has a

Commander Evangeline Booth

NEARLY HALF a million of the poor and less fortunate throughout the country will look to The Salvation Army for some of the good things that mark the Nation's Yuletide rejoicing. Irrespective of creed, race or color we shall distribute our Christmas baskets and toys for the little ones — honest need being the sole qualification. May I count on your kindly assistance in meeting this insistent demand?

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plate camera of the smaller sizes, he will do well to carry sufficient plates for the entire trip. These will keep for three or four months in this climate, if left in the original packages.

"The problem of exposure is quite different from that encountered in the United States, and the tourist would do well to equip himself with a reliable actinometer and use it religiously at first. The foliage is very dense and in consequence the shadows are much heavier than they are in the United States. Thus the tendency is to underexpose in all landscapes with foliage in the foreground.

"However, on the coast or over water the reverse holds true inasmuch as the light is stronger and somewhat shorter exposure is required than in similar situations in the north. This also is true of the cities, inasmuch as nearly all the buildings are white and the light in the streets is nearly always very intense. This is quite the reverse of northern cities where longer exposures are needed for street scenes.

"Development can be handled much in the same manner as in the north. In the larger cities one can find reliable finishers to whom can be entrusted the task, should the photographer not care to carry an outfit with him. However, let me sound a word of warning against the smaller shops in the cities or in the smaller towns. I know from sad experience that most of them can be depended upon to ruin the most cherished pictures in the lot. A fairly good plan is to mail your undeveloped films back to some well-known finisher in the north. However, it is difficult to do this with plates, both on account of danger of breakage and their weight.

"If the tourist wishes, he can easily carry a tank with him, and do his own developing. This has the advantage that if pictures are lost through over- or underexposure, the mistake can be corrected next day, instead of losing the majority of the photos of the trip. Personally, I follow the same formulas as in the north, with the exception of using a strong hypo solution, which I harden with a little formalin instead of the usual hardener.

"In conclusion let me say that the photographic opportunities are unexcelled in these beautiful islands, and the careful camera-wielder is sure to return home with a collection that will richly repay his pains."

---

### *Help Wanted*

In connection with their work on the study of insect parasites of domestic birds and animals, the Bureau of Entomology of the U. S. Department of Agriculture has issued a call for help in obtaining specimens of external parasites of all wild animals and birds, especially the game species. These insects and related forms, including the biting lice, sucking lice, fleas, bird flies, mites and ticks, cause lowered vitality and loss of life. Collectors may preserve the specimens in small vials containing a 70 per cent solution of grain or denatured alcohol or in three per cent formalin. The specimens should be sent to F. C. Bishopp, Bureau of Entomology, Washington, D. C., and the bureau will send small vials containing the preservative to anyone interested in aiding the study.


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# NATURE MAGAZINE

PUBLISHED BY

## THE AMERICAN NATURE ASSOCIATION

To Stimulate Public Interest in Every Phase of Nature and the Out-of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America



THE MAGAZINE

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THE "most senseless and atrocious" slaughter of wild animals that has, perhaps, ever occurred. Thus does at least one Wyoming newspaper describe the killing that attended the six-day open season on prong-horned antelope in certain counties in Wyoming during the past fall. Sportsmen, if thus they be styled, drove in high-powered cars into the herds of animals, shooting them down from all sides. Many of the antelope encountered blood lust in man for the first time. They ran wildly in circles, then attempted escape, only to be mercilessly followed and butchered. Through the streets of Cody, Medicine Bow and other cities flowed hundreds of cars containing the carcasses of these animals, driven proudly by these so-called sportsmen.

It is to the credit of Wyoming that many of the leading papers of the State were eloquent in condemning the affair as a disgrace and a blot. Albeit there was some thought of Eastern disapproval in this stand, the newspapers were sincere in their revulsion of feeling. The blame would seem to be divided between the authorities and those who were willing, in the name of sport, to shoot down these gentle and defenseless animals.

The prong-horned antelope is the sole representative of its family, found nowhere else than in North America, a fact that should be a powerful argument for its preservation. It was once so numerous as to rival in numbers the bison, but has suffered such sad diminution during recent years that fear has been expressed by many well-informed students that its extinction was imminent. A few years ago special efforts were made to ascertain the numbers remaining, and a rather liberal estimate showed approximately 30,000 on the entire continent. Seven thousand of these were credited to Wyoming, a state where fifty years earlier a single valley, the Big Sandy, had harbored as many as now exist in all America.

For about nine years the Game Commission has been authorized to permit the killing of one buck antelope under a special license granted to a limited number of hunters, and in certain counties. The present season is apparently the first time that the privilege has been actually extended, and the license fee was reduced to $2.50, while the limitation as to numbers has been removed. This liberality has evidently proved too great a temptation to the sportsmen of Wyoming. We doubt if those hunting under the circumstances noted were always careful to pick out bucks as their victims, and we cannot help wondering how many of the innocent animals were crippled, and left to suffer a lingering death. A most regrettable aspect of the matter is the realization that this beautiful species can suffer such slaughter in one state while efforts are being made in several other states to obtain sanctuaries for its protection. In the present case the ban was lifted ostensibly to reduce certain herds on overstocked ranges, but unfortunately the season was opened in some counties where very few of the animals are left, thus raising a question as to actual motives.

There is, unfortunately, in this country, and perhaps the world over, too much remaining of that instinct to kill that is a part of our savage heritage. Only lately, when its wild victims are about to vanish, has this tendency been revealed in all its hideousness. And now, when realization has come, pitiless commercialism still tells the unthinking that such slaughter is justifiable.

Where then must we place the blame for such sad and disgusting exhibitions as this of the Wyoming plains? It would seem upon mankind in general, whose level of understanding is too often still that of the savage. Nay, lower yet, for the savage killed for food and for clothes to warm him. Our task is not, primarily, to berate the State Game Commission of Wyoming, however egregiously it may have blundered. Ours is to look within ourselves as members of the higher order of animals that we complacently regard ourselves to represent.

Wyoming's slaughter of the antelope is only the instance of the moment. Killing of wild life, less spectacular, perhaps, but equally devastating and enormously greater in volume, takes place annually as the "seasons" roll around. As human beings we must come to a clearer understanding of what is sport and what is plain, blind slaughter. We must arrive at some understanding out of our intelligence, our fundamental rightness, our civilized instincts, and not by the aid of specious propaganda.

A STUDY OF RED FOXES

*Reproduced from an original drypoint etching by Benson B. Moore*

NATURE MAGAZINE

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THREE JUNGLE COMPANIONS
*Above mother sloth and babe snooze; at the left the great Panama curassow, and at the right is a black howler monkey looking a bit belligerent*

# A JUNGLE LABORATORY

## Companions of the Wild at Barro Colorado Island

by Dr. Alfred O. Gross

*Photographs by the Author*

WHEN the canal builders threw a dam across the Chagres River and created Gatun Lake, the largest island within this new body of water became known as Barro Colorado Island. Rich in the teeming tropic life of a rain forest of the Torrid Zone, this island was set aside in 1923 by the Governor of the Panama Canal Zone as a permanent reservation where natural wild life conditions in the Tropics are to be maintained. On a hill, overlooking the beautiful lake from one side and in the embrace of a primitive forest on the other stands the biological laboratory of the Institute of Research in Tropical America.

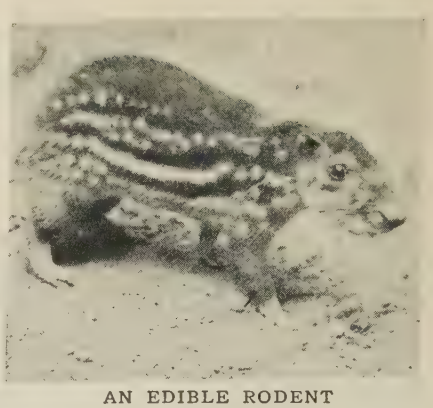
In the depths of this great forest, the birds and mammals live a natural life. Yet always they are under the harsh laws of the survival of the fittest in an environment where the struggle for existence is extreme. When man visits this island he becomes a part of its complex animal association. At first there is a mutual distrust but man soon learns that even the larger carnivorous animals such as the ocelot, the puma and the jaguar are never aggressive. On the other hand, the denizens of the jungle are, with increasing confidence, making frequent visits to the area around the laboratory. Here the birds and smaller animals have discovered a zone of protection. The visiting naturalist may choose to walk the miles of excellent trails cut through the 3,600 acres of impenetrable forest where there are evidences of the presence of the inhabitants on every hand. Yet if he remains at the laboratory, he will probably see more of them. There every hour brings the new, the interesting and the unexpected.

*Dr. Gross is well known for varied work in the biological field. He is on the faculty of Bowdoin College, Brunswick, Maine, and in charge of the investigation of the mysterious diseases affecting ruffed grouse in New England. Dr. Gross has also devoted much time to the battle to save the heath hen, now believed to have joined the ranks of extinct birds*

Dawn comes quickly in the Tropics, and at Barro Colorado the silence of night is suddenly broken by the strange voices and notes of many birds. The little green paroquets, which, like English sparrows, seek out the habitations of man, fly about in wild confusion in the tree tops above

THE TURKEY VULTURE

*A quite common bird around the laboratory and not exactly a beautiful fellow in habits or in looks*



AN EDIBLE RODENT

*Prized by the natives as food, this fellow is often shot by jack-lighting*

the laboratory, and awaken the late sleepers with their loud monotonous clatter. Parrots on their way to favorite feeding grounds fly overhead in pairs, announcing their presence by loud piercing shrieks. In one of the tallest trees in front of the building is a splendid colony of oropendulas, large, beautiful birds marked with rich brown, black and yellow. They have built long pendant nests which are suspended from the topmost branches, swaying in every breeze. The gurgling liquid notes of these oriole-like birds are always an important part of the morning chorus during their nesting season. As one looks out through the opening towards the lake there is a constant procession of birds passing from the jungle of one side to the other. Toucans, with their enormous and grotesquely colored bills, labor across the space like overweighted airplanes. Flycatchers, with brilliant yellow breasts, perch on the tops of the giant banana leaves, where they are ever on the alert for every passing insect. Beautiful iridescent hummingbirds sparkle in the morning sunshine as they hover about the flower-covered vines which cling to the great trees. As one surveys the jungle margin with a pair of powerful field glasses he is impressed with the large number of birds which may be seen flitting in and out of the dense foliage.

THE SHORT-KEELED TOUCAN

*It staggers under the Latin name of* Rhamphastos piscivorus brevicarinatus

Often you may see troops of monkeys, which, in passing, linger in the tree tops, perhaps out of curiosity for the queer human inhabitants of the station. Their challenging, roaring cries reverberate through the jungle and remain long in the memories of every one who is fortunate enough to hear them. One afternoon when a troop of these black howlers went by the laboratory, a baby monkey was separated from its parents and left all alone in the top of one of the trees. It was rescued by the keeper and added to the interesting group of station pets. During the summer of 1927 a family of night monkeys occupied a hole in a tall tree which overlooked the laboratory. Without doubt these frail little fellows had sought out this place near us because of the protection it gave them from predaceous animals that shunned human habitation. At daybreak we could see them coming home from their night rovings to sleep for the rest of the day. One morning their daily routine was interrupted because, during their absence in the night, a porcupine had decided to take the monkeys' bed for his own. They were powerless to remove this living pin cushion and after an indignant protest disappeared into the trees. They were deprived of their home only temporarily, however, for Donato, the Indian boy, climbed the monkeys' llano and removed the spiny intruder. This porcupine differs from our northern species

ADULT COATI OUT ON A FOOD HUNT

*These animals frequently come to the clearing about the laboratory for food and without fear*

LOOKING OVER THE LABORATORY

*This is one of the black howler monkeys who make themselves heard in no uncertain terms as they go through the trees*

PORTRAIT OF A BLACK VULTURE

*He is always on hand when there is a feast on the carcass of some victim of the jungle*

in having a prehensile tail which enables him to cling with greater ease to the branches and vines of the forest. Furthermore, this species does not have a heavy coat of hair between the quills. The climate makes such a covering superfluous.

One of the strangest of all animal companions at Barro Colorado is the sloth. It lives its whole life up side down. Instead of walking on all fours he clings to the underside of a limb and normally crawls, eats and sleeps in this curious position. There was an armadillo who lived in an excavation under the board walk in front of the laboratory. The results of his digging industry were plain evidence of his presence, but it was only on rare occasions that he ventured out of his subterranean home. In spite of his heavy armor he was active and it required no little effort to capture him when we desired to examine him at close range. If left alone, he would explore about the vegetation, offering us excellent opportunities to observe his curious behavior. Another animal which appeared not infrequently was the coati. These rather large carnivorous animals are well able to compete with others of the jungle and did not come to the station for protection but rather to secure choice bits of food. They are especially fond of bananas. In fact, bananas proved too much of a temptation for one large male which was coaxed into the building by means of a trail of small pieces. Mr. Coati had the surprise of his life when the spring door banged behind him. He was held prisoner for a few days, literally stuffed with all kinds of tempting food, and then allowed to go on his way to join his fellows.

NEST OF WAGLER'S OROPENDULA

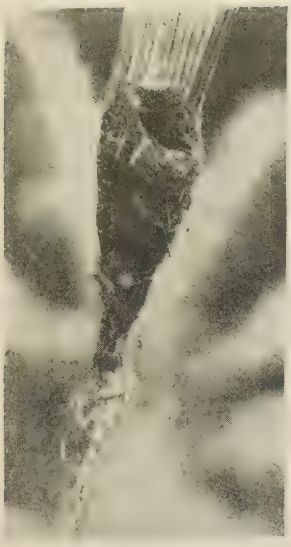
*One of the many interesting nests built in the colony near the laboratory*

Since the laboratory was built, a little finch-like bird known as Hick's seedeater has found the small clearing in front of the buildings, a hospitable place to live. These finches are characteristic of the great savannahs and cultivated areas. They are not a jungle bird but here is an isolated spot where they have found a haven of protection. They find here not only food but a safe place to build their nests and to rear their young. The males are black with minor markings of white, whereas the females are modestly dressed in a dull clay color. They are hearty, adaptable little creatures with a pioneer spirit which has made them one of the most successful species in the tropics. Their sweet concert singing in the early morning as they sway on the long rain-dripped grass stems is one of the pleasant experiences of the day. These birds are especially in evidence during the month of October, when seven of their nests have been found in the shrubs and small trees of the clearing near the station.

AN ANTEATER OUT FORAGING

*It approaches a small termite's nest in search of its favorite and principal food*

Many birds make their permanent home in the Tropics and some may spend an entire lifetime on a restricted area such as Barro Colorado Island. But others found there during the winter months migrate to the north to build their nests and to rear their young. During the months of September and October many of the familiar bird ac-



A HOME IN THE TIP OF A PALM LEAF

*The nest of the Nicaraguan hermit, a species of hummingbird*

"RADIO", PET NATIVE DEER AT THE LABORATORY

*This is a portrait of a fully grown adult male of this species*

quaintances of the north appeared in this environment where they seemed much out of place among the palms and other tropical vegetation. Great flocks of nighthawks were seen during the latter part of September. Some of them flew high, winging their way to winter homes still farther south; others lingered and repeatedly circled about the clearing and over the lake to capture some of the many insects always to be found there. One morning a nighthawk unexpectedly swooped down and alighted on an old log directly beside us. It seemed tired and somewhat bewildered, but still allowed us to take several pictures at close range before flying. How interesting it would be to know the story of this welcome visitor. Where did it nest? Was it successful in rearing a brood? What were its most thrilling experiences in its long flight of thousands of miles in coming to the Tropics?

A NIGHTHAWK DROPPED IN FOR A CALL

*Many familiar birds coming south for the winter were seen at the laboratory and were like old friends to those from the North*

On another day a little yellow warbler appeared in a papaya tree just outside of my laboratory window, carrying my thoughts to a pair of these birds which nest each year in a certain honeysuckle bush at Brunswick, Maine. In October a spotted sandpiper was seen on a clay ledge along the lake. How good it was to see his teeter and hear his sharp piercing calls again. Almost every day during the late fall brought hosts of migrating birds. At one time the trees in the ravine at the right of the laboratory were literally alive with kingbirds. It was a strange sight to see them side by side of their highly colored cousins in an environment totally different from the old orchard they left behind in New England.

We had many interesting and strange companions at the jungle laboratory but none of them thrilled us more than these old familiar commonplace bird friends from home.

One might spend years on Barro Colorado Island and yet see but a small part of its interesting life. There are few places of equal area in the world where such a wealth and diversity of animal forms can be found. The insular isolation has been an important factor in the concentration and preservation of this life and this feature has also contributed to making conditions ideal for working out certain biological problems. On this Island the

A TWO-TOED SLOTH QUITE COMFORTABLE

*These peculiar animals live a decidedly upside down existence because they like it*

AN ARMADILLO

*This one lived under the walk at the laboratory, always an interesting fellow to meet and to study*

naturalist may dwell undisturbed with his strange jungle companions to study and to reveal their innermost secrets of life. Comparatively little is known concerning the commonest of the species of birds and mammals, a fact which adds great zest to any life history study in the tropics.

THE MARMOSET OR SQUIRREL MONKEY

*The most interesting and curious of jungle companions*

A COMMON GREEN LIZARD

*Note the length of the tail in this species*

CLOSEUP OF PORCUPINE

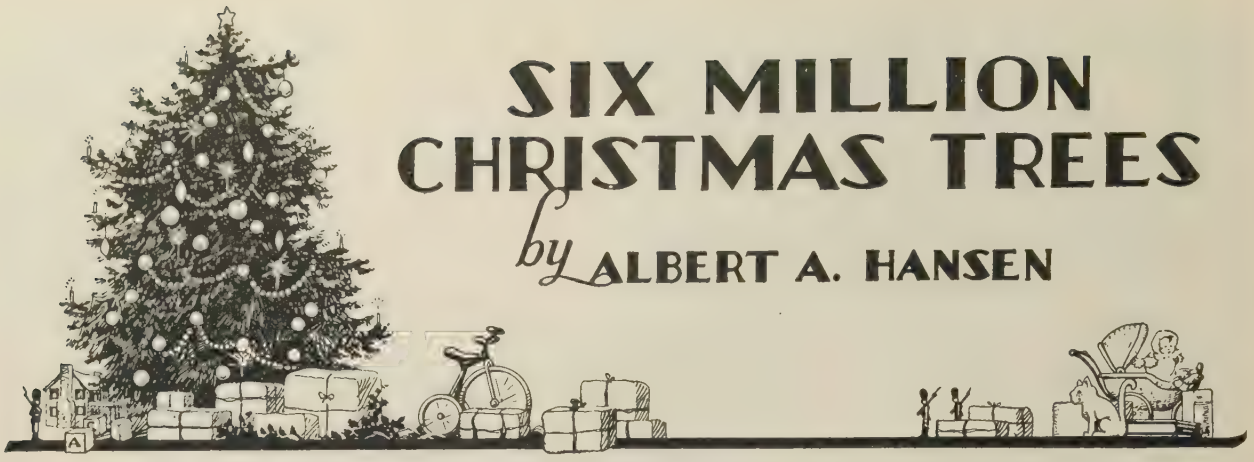
*This shows well the spiny coat and the prehensile tail*

One would have to travel a long hard journey to the interior to meet with similar primitive conditions and yet from the door of the laboratory on Barro Colorado you may see the ships of the world pass in review and all too frequently hear the roar of an aeroplane passing overhead to remind you that you are near civilization.

Lovers of tropic Nature are indebted to the men whose foresight revealed the possibilities of Barro Colorado and whose persistance persuaded the Government to set aside this Island Ark as a permanent reservation where our companions of the jungle may continue to live their lives unhampered and unharmed by the constant greed of man.

---

*The issue of Nature Magazine for February will be one of varied appeal, from the leading article on hunting the mountain tabby cat with a movie camera to a little story about a snail as a pet. That issue will include another fascinating story by Charles Fitzhugh Talman, who has been missing from our pages for several months. He writes about the Gulf Stream and what it does. Ben Hur Lampman appears again with one of his appealing stories, this time about a murre named Skipper. Lewis Radcliffe of the United States Bureau of Fishes tells how to go farming in the water. A. Brooker Klugh writes about the speedy little subway digger of the forest, the short-tailed shrew. C. F. Greeves Carpenter suggests a novel hobby by telling how to raise insects. Another biography; this time about Dr. Leland O. Howard, one of the most interesting figures in our scientific world today. That is not all, either, for February.*



# SIX MILLION CHRISTMAS TREES

by ALBERT A. HANSEN

After the mistletoe has been hung with due ceremony, the stockings arranged in order along the the mantel over the fireplace, the wreaths and bits of holly put in their proper places and the most important object of all—the Christmas tree—gayly festooned with glittering tinsel and decorated with bright trinkets and presents, have you ever, while resting and surveying the final effect of your decorative ability, wondered what sort of a tree was glorifying your Yuletide and where in the world it came from? Or possibly you have been asked embarrassing questions along this line by the youngsters!

If you live in the country of course the answer is easy,—you went into the woods and cut a wild cedar, pine or hemlock or possibly indulged in the popular but reprehensible habit of topping a hemlock of near saw-log size. But if you are a city dweller who must purchase his Yule tree, what is the best kind to get? What choice is being offered?

The answer depends very much upon the section in which you happen to live. The aristocrats of Christmas trees are the firs on account of their excellent pyramidal shape, beautiful deep green hue and soft, fragrant, persisting needles. The firs can usually be recognized by the fact that the flattened leaves are arranged in two rows on the horizontal branches, due to the twisting of the leaf base. Each needle is shiny dark green above and except for the prominent mid-rib, is silvery white underneath, due to the multitude of breathing pores on the under surfaces.

WHAT DECORATED TREE COULD IMPROVE ON THIS?
*A silver fir points its spire to heaven on Christmas morning from amid its snowy decoration*

The species of fir available vary with the locality, but the most popular kind offered in the East is the balsam fir, the bark of which yields the well known Canada balsam used in medicines and perfumes. In the southern states the Fraser fir or she balsam, very similar to the northern balsam fir, is common on the market, while on the Pacific Coast the favorite is the handsome white or concolor fir, a species that frequently graces Eastern lawns as an ornamental.

Competing with the firs for Christmas popularity in the eastern states are the spruces with their scattered, four-sided needles that seem to point in all directions. Spruces are frequently confused with pines but they may be easily distinguished by the fact that pine leaves always occur in groups of from two to five, while spruce leaves grow singly. Most of the usual Christmas pines and firs also have much longer leaves than the

WHENCE COMES THE YULE-TIDE CHEER
*A common variety of red spruce in the East, growing on waste land useful for little else*

spruces offered for sale. On the big city markets of the eastern seaboard the black and red spruces predominate, but these two species to a large extent give way to the less desirable Norway spruce in the Middle West. The black spruce, the wood of which is used in violin making and the twigs, formerly, in spruce beer, has short, thick, pale, bluish-green leaves, while the foliage of the red spruce is slender and of a dark-green or yellowish-green cast.

The firs and spruces comprise the best grades of Christmas trees. The less expensive kinds are usually pines or hemlock. In the East the white pine with its needles in bundles of five, in the South the scrub pine with needles in pairs and in the West the well known lodgepole pine are the principal species. Hemlock can be recognized by the short flattened leaves arranged in two rows with a pair of prominent white lines on the under surface of each leaf. Although this tree will do in a pinch, it is among the least desirable of our Christmas trees as the leaves soon begin to fall and mess up the floor.

The firs, spruces and pines from the New England forests and the Appalachians in the East, the northern waste lands in the Central States and the mountainous regions of the Pacific hinterland supply the bulk of the Christmas demands but there are a number of minor species of considerable importance that should not be overlooked. It is by no means uncommon to find arborvitae, a familiar ornamental species, with flattened, scaly foliage, offered among the better class of trees, and the common red cedar or juniper, source of cedar chests, fence posts and matches, sold among the less expensive offerings. Almost any species of evergreen that thrives locally may be pressed into service to gladden the hearts of the youngsters during the Christmas season. Even juvenile specimens of the famous giant Californian redwood may do their share toward spreading Christmas cheer.

There is an entirely different class of Yule trees,—live specimens purchased from nurseries to be planted in the open as living reminders of the season of good cheer. This is a new and wholly delightful custom, caused by high prices, the rapid growth of the conservation attitude toward wild trees and an increasing desire for beautifying home surroundings. Although wild specimens dug out of woods and fields,—with the permission of the owner, of course,—may be used, they are more difficult to handle, less attractive and far more fragile of life than nursery-grown plants. The latter are usually supplied with a ball of earth around the roots on which an overcoat of burlap has been fitted. The burlap-covered ball of earth may be set into a tub or directly on the floor and the burlap hidden with colored crêpe paper. When the festivities are over, the tree may be maintained in a thriving condition by merely keeping the soil moist until the ground has thawed out sufficiently to permit the digging of a hole for its reception. There is no need even to remove the burlap which soon rots and is easily penetrated when root growth is resumed in the spring. The chances for successful transplanting are excellent and the little Christmas tree will soon grow to robust proportions, with its value constantly enhanced by the pleasant memories it inspires and by its ever-increasing beauty.

There are a number of attractive nursery evergreens well suited for the rôle of live Christmas trees that may be had at prices suited to almost any pocketbook, the choice ranging from a modest outlay for the Norway

A FAVORITE CHRISTMAS TREE
*The cedar is handsome in any room, as thousands of happy children attest each season*

spruce and a medium expenditure for the white or concolor fir to a lavish disbursement of from twenty to thirty dollars or more for the expensive Colorado blue spruce or Koster spruce. Both the Colorado tree and its Koster variety are noted for the beauty of the striking light blue new growth that appears each spring. The white fir has so many good points as an ornamental that it may well be considered the best of the firs for landscaping purposes. It is hardy, of rapid growth, and can withstand both heat and drought. The cheaper Norway spruce is probably the most familiar of planted spruces. It develops rapidly into a large, handsome tree with drooping branches that may be grown alone or for windbreaks. On account of the distinct tendency toward natural pruning, however, the tree becomes somewhat scraggly in appearance on maturity.

THE KING OF THEM ALL

*From one coast to the other, the white fir is recognized as the finest of all the Christmas trees*

A question that is brought up every Christmas season by the conservative conservationists is the restriction of the use of trees in the interest of forest conservation. It is true that in order to meet the annual demand somewhere in the neighborhood of six million trees are needed but when the facts are looked at in proper perspective no one need hesitate in celebrating the Christmas season by a custom that has been handed from generation to generation since the days when our pagan ancestors gathered around the blazing Yule log. In the first place, most of our Christmas trees are the result of thinning heavy stands of evergreens that are actually improved by this process. Nature, you know, is so lavish that there are practically always more trees present than can possibly mature. The proper thinning out of the smaller trees gives the rest a better chance to become lumber, railroad ties, fence posts, chests, matches, pulpwood and other products of the forest. Furthermore, a large proportion of the trees found on the Christmas market never came from the forest, being the product of waste land of too poor a quality to be cultivated with profit and entirely unsuitable for merchantable timber-growing. Again, the growing of trees for the Christmas trade is an industry that is increasing in proportion. We need have little fear,—consider the European forests that have supplied Christmas trees to the children of Germany, the home of the beautiful custom, and other countries for untold generations without the slightest apparent harm.

Although wise foresters have no sympathy with the joy-killing and ill-informed conservationist who advocates a treeless Christmas, they are heartily in accord with the movement to regulate the trade to prevent the annual waste represented by the wholesale destruction of trees to bolster up the prices on overstocked markets, a waste that has been estimated during some seasons to reach the appalling total of twenty-five percent of the entire supply. There should be some way of ascertaining market demands or else of disposing of the surplus to needy families that can ill afford to buy their own trees. There must be many families without the cheer of Christmas evergreens, and truly, what is Christmas without the decorated tree in the corner aglow with the lights and gleaming with be-ribboned presents? It is one of the most beautiful symbols of Christendom, and every home should have one. Instead of 6,000,000 let us have 30,000,000 Christmas trees,—one for every family.

Let the season that celebrates the birth of Him who loved little children bring to each house where children dwell the decorated tree that means so much in their lives.

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*THE most recent expeditionary activity of the American Nature Association under the leadership of our President, Mr. Arthur Newton Pack, and William L. Finley, led into the rough land of Arizona in search of motion pictures of mountain lions. This adventure, filled with hardships, was finally crowned with success, and the story is told as the leading article in the February issue of Nature Magazine, with illustrations from pictures taken on the trip.*

# SNOW FLAKES

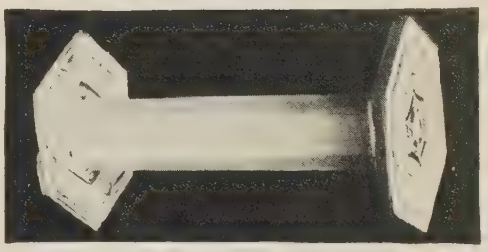
## In the Making of Which Nature Shows Her Greatest Artistry

by Constance L. Lyon

*Illustrated with the Photographs of Dr. Wilson A. Bentley*

MARVELS OF JACK FROST—ARTIST

*Above the snow flake Masonic emblem, at the left the wondrous cuff-button and at the right a "bobbin"*



It is to a farm boy's love of the snow flake that science owes its knowledge of these gems. The child's interest was born on the memorable day that brought him a microscope. Then he entered fairyland, and began to peep at Nature's hidden treasures,—the wing of a butterfly, a bit of moss, and many a strange little insect. But it was winter that brought him triumph, because then he caught a snow flake. Its beauty fascinated him and set his heart paining with desire that all the world might see it as he saw it. Longing led to dreaming dreams that were to come true, because his mind hit upon a way to photograph snow flakes.

Boylike, he said nothing about it, only pleaded for a camera and a powerful magnifying lens, a lens that would magnify many thousands of times. Christmas brought both: In a few weeks, lens fitted to the camera, he was ready to photograph snow crystals magnified three thousand six hundred times. A workshop outdoors, where the temperature would stand at freezing, was quickly built.

The first snow flurry saw a board covered with black velvet placed invitingly in the open air. A snow flake fell lightly to rest. The boy darted forward. Holding his warm breath lest the crystal melt, he seized a sharp-pointed stick, and with a light, sure touch gently lifted the crystal from the board to the camera slide. In the twinkling of an eye a single snow flake evaporates, but he snapped the camera in time.

Today that boy is Professor Wilson A. Bentley, authority on snow flakes, and the pioneer of snow crystal photography. He still uses his early methods; still uses the same camera and lens.

"I can't remember the time I didn't love the snow flake more than anything else in the world," he said, as he told me the story of the snow crystal's life.

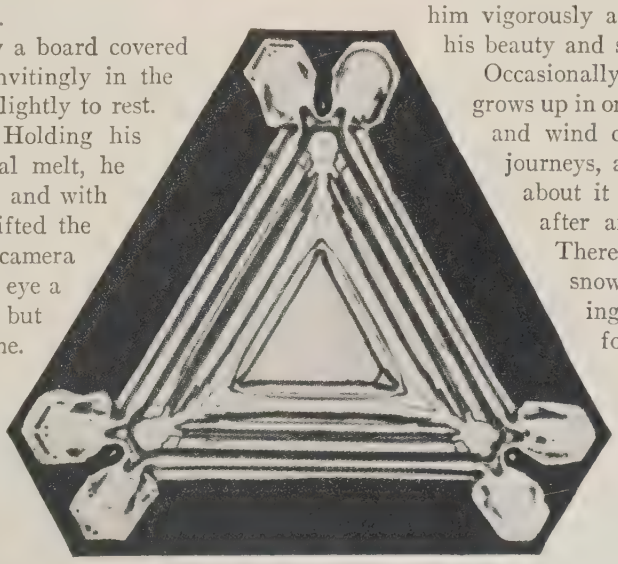
When Jack Frost is about, Nature says, "I shall now create two different kinds of snow flakes. I shall use my daintiest material, invisible water atoms, for snow flakes marvelously beautiful; but for the other sort I'll just give Jack Frost some of the coarser visible cloud vapor, and tell him to freeze it into plain little pellets, and toss them to earth."

The lovely variety, the crystalline, Nature sends us in almost every snow storm. Sometimes these snow flakes arrive in armies of trillions upon trillions; at times flying all bunched into one big flake, and at other times singly.

The unbeautiful, the granular variety, are wee snow balls, about the size of granulated sugar. Frequently while an exquisite crystalline snow flake is traveling on an earthward journey it is attacked by these mischievous granular snow balls, who snow ball him vigorously and sugar him all over until his beauty and shape are lost.

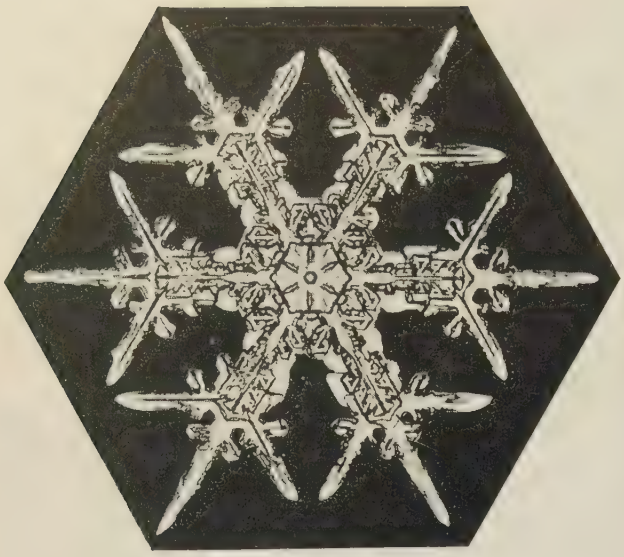
Occasionally a snow flake is born and grows up in one cloud, but more often storm and wind carry the tiny thing on long journeys, and as the crystal is buffeted about it adds to itself one new form after another.

There are many collisions among snow flakes while they are traveling, but Nature often provides for her injured little ones, and crystallizes them over again into new and perhaps even more beautiful and curious shapes. Sometimes she creates a variety known to science as "cuff buttons", or "bobbins". These first are called "compound crystals", and are made up of two dif-



A FLAKE THAT SIGNS ITSELF "THREE"

*Most snow flakes are six-sided but here is one of the rarer variety*



A DIAMOND PENDANT

*At the right a star fern, and below, another fernlike flake*

A LOVELY DESIGN

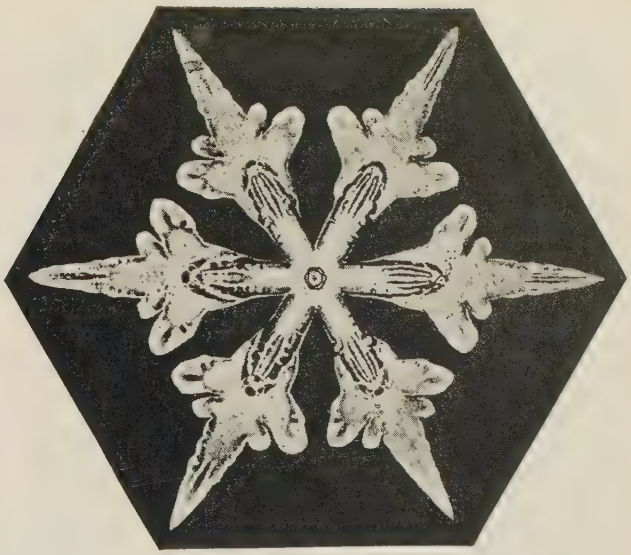
*Flake below like a spider web; a rare one at right*

ferent kinds of snow flakes. To make them, Nature catches a flake that is long and shaped like a tiny column, and attaches to each end a flat crystal.

And the longer ones, the "bobbins"! Dainty air-jeweled bobbins whereon the fairies must wind the mist and weave the stuff that dreams are made of! Or are they really sun-dials? Imagine fairies keeping tab on the sun in cold cloudland!

Some of these compound crystals have four wings, all standing out stiffly at right angles. They are "the four-winged butterfly" variety, and fly in zero weather from very high clouds.

The little snow-travelers that kiss our cheeks on a winter day are usually minute six-pointed snow-ferns, six-pointed stars, or like tiny six-branched pine or fir trees. Some take the form of a conventionalized six-petalled flower, while still others are just solid blunt-pointed hexagons. So, because its usual number of sides



THE STAR FLOWER

*Below a feathery flake with a star form at the left*

or branches is six, and its angles are exactly sixty degrees, science declares the snow flake has a "signature", and signs itself as "six". However, a few snow flakes that arrive upon rare occasions from very distant clouds should sign themselves "three", for they have only three sides, being triangles.

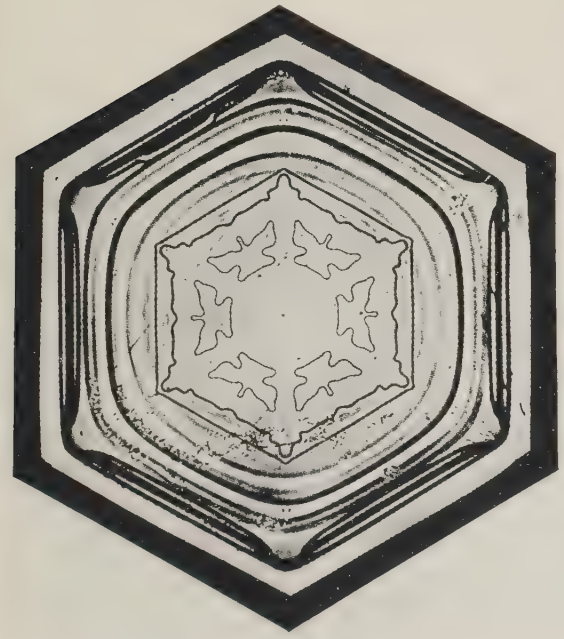
If you look at a snow crystal under a microscope you will discover on the crystal's fragile surface most exquisite designs. They are traced by unbelievably minute hollow tubes filled with air. Glistening in the prismatic colors of the rainbow, or perhaps throwing dark shadows which lend depth, they add greatly to the crystal's frozen beauty. Let your imagination run for a minute: all this is in the space of but one-tenth of an inch in diameter, for that is the size of the average snow flake.

No two snow crystals are shaped or ornamented ex-

*(Continued on page 57)*

MARVELOUS FLAKES

*Note the air tubes in the one below. At the right a solid*



HAIL TO THE DESERT ASTER

*Superlative one of all western composites, its lavender rays and yellow center make gay the desert*

# WHEN the DESERT BLOOMS

## Its Glory Comes with the Rains

by Francis M. Fultz

THE desert, from May to December, is as drab as a Labrador Island, or a sand-shoal far out to sea. All annual plant life lies dead, and often has utterly vanished. Bare sand and gravel bake in the sun, with hardly a growth of cactus or creosote-bush to relieve the unending monotony. Those who see it then wonder at the waste and desolation. But they should come here in the late winter months, when the desert puts on its flower show.

It is worth an entire trip across the continent to behold the "waste places" of southeastern California and western Arizona when they are in bloom. With unending stretches of dancing color, they become a mighty greenhouse of Nature with a vault of blue for the dome.

These wonderful desert "wild flower shows" come only occasionally, however. There must be early winter rains in at least fair quantity to bring them. Usually two to four years intervene, and even six or seven years have been known to pass with no more than a few scattered flowers to relieve the dreary sameness of the sandy barren. But no matter for how long a stretch the flowerless years may run, when the early winter rains do finally come in sufficient quantity, the desert riots in endless floral life.

Nor need much rain fall. Elsewhere in our country, "a sufficient quantity" would be considered as a very scanty rainfall indeed, and the period in which it came would be reckoned as "a long dry spell." Three or four inches is a liberal allowance; and if the amount be five or six inches, the season is accounted exceedingly wet.

Then the miracle happens—and miracle it seems to many, for whence come the seeds to cause such display? The answer has long been a source of lively discussion. Desert-dwellers are quite generally agreed that the seeds lie in the ground from one season of flower profusion until another of sufficient rainfall comes around. They are probably right, for the vitality of many seeds will endure for a score or more years, when deeply buried, or when protected from moisture. Again, these desert plants are marvellously fecund. Single plants of the more common species,—such as the white evening primrose and the sand verbena,—produce thousands on thousands of seeds. No matter how dry the season, there are always a few specimens of the different sorts scattered here and there,—perhaps under some shrub, or

AN ACTOR IN THE DRAMA

*The desert satin star never fails to add its note of beauty to the lavish display of the Southwest*

in the lee of a sand dune, or along the washes. They may be dwarfed and stunted, but nevertheless each of them is likely to produce enough seed to cover an acre with flowers in a favorable season,—and the desert winds take care of the distribution.

Flowers of many kinds enter into this decoration of the desert, but the great fields of solid bloom are made by annuals, and these largely of two or three species. The two which predominate are the so-called sand verbena, *Abronia villosa,* and the desert snow, or white evening primrose, *Oenothera tricholyx.* A third, but less plentiful, is the desert sunflower, *Helianthus tephrodes.* Indeed, this latter one does not compare in abundance with the other two. A few more may occasionally enter into the mass display, but no one of them is apt to make more than a local spread of color where it grows by itself. Among them are several species of the evening primrose family. Many are flowers of beauty and distinction, worthy of many pages of description, or better still, of being seen.

THE SUNFLOWER

*Endless waves of yellow spring up when rains call it in bloom*

FLOWER OF NIGHT

*Just one plant of the evening primrose, most prolific of desert growers*

The sand verbena is perhaps the greater actor in the drama of desert bloom. Its reclining, vine-like stems cover the sands for league after league with a low tangled mat that is solidly overspread with reddish pink. The stretches of brilliant color are often unbroken for miles, except perhaps by an occasional shrub, and glow with vivid brilliancy under an unclouded sun. The display is incomprehensible to one who has not seen it, and indescribable by one who has. While it lacks the soft, soothing effect made by the evening primrose, and doesn't please as well under close inspection, it has other qualities which compensate for any lack in these respects. Moreover, it has a longer season, prospers under more adverse conditions and its exhibition extends through the twenty-four hours of the day.

Yet, to many, the evening primrose is the desert's greatest flower. Its soft, gray-green foliage blends so harmoniously with the general tone of the desert that it seems especially designed by Nature for the place it occupies. Its territorial distribution is much more extensive than that of the sand verbena, but its plants are seldom so thickly-set on the ground, and in the earlier stages of their growth they often seem quite lost on the wide expanse of sand. But they are rapid growers, are of a low spreading habit, and have a generous supply of large leaves; so in a comparatively brief time they hide the naked sand over great areas.

This plant is an evening bloomer. Its flowers are three or four inches across, and almost pure white. They live but a single night, fading early in the day following their opening, and taking on a pink tint as they wither. So prolific in bloom, however, is the primrose that each succeeding night finds its fields a spread of snowy whiteness.

The sand verbena and the white evening primrose are very tolerant of each other's company, and the red-and-white combination is not at all uncommon. In the early morning, before the white evening primroses have begun to fade, such mixed fields are exceedingly charming. The tone is more subdued than is the solid spread of reddish pink made by the sand verbena alone, and livelier than the evening primroses themselves ever become.

The traveller may occasionally see the desert brilliant with these two favorites from the car windows of the Southern Pacific trains passing through southwestern Arizona and southeastern California,—especially in the region along the Salton Sea in the Golden State. The more extensive stretches lie some little distance away from the railway. They are easily reached by automobile, however, as at the time the flowers are in bloom the desert roads are usually in very good condition. The highway between Palm Springs and Indio, California, passes through one of the larger garden plots.

The stretches where the desert sunflower riots are yellow, as are all those on which grow any member of genus *Helianthus.* They are neither very common nor extensive and they do not present a solid spread of color. But the plants are slender and upright, and knee-high or taller, so there is always a waving motion when the wind blows, —which is pretty much all the time,—and a consequent changing of tone and tint.

Of the many annuals which here and there add a bit to the decoration of the desert, but which nowhere present wide patches of color by themselves, there may be mentioned the five-spot, *Malvastrum rotundifolium,* spectacle-pod, *Dithyrea californica,* desert cotton, *Baileya pauciradiata,* morning bride, *Chaenactis fremontii,* desert star, *Eremiastrum bellioides,* chylismia, *Chylismia scapioides,* and at least a score of others, among which are two or three small-flowered day-blooming members of the evening primrose family which are indiscriminately known as "sun-cups" to the natives.

WHEN SOUTHERN CALIFORNIA BURSTS INTO LIFE
*Dead, drab, barren from spring to winter, the desert garbs itself in splendid beauty from December to May*

The five-spot and the spectacle-pod are true desert plants. These are among the most widely-distributed of all the annuals. With its dark-wine or red blotch at the center of each of its five light-lavender petals, the five-spot is certainly well and appropriately named. I have seen this marvellous flower in almost every section of the Colorado desert and in many parts of the Mojave, even on the floor of Death Valley—that *ne plus ultra* of desolation. The spectacle-pod, that little "cross-bearer" which has its seed-pods shaped like a pair of nose-glasses, seems to have just as widespread a bloom.

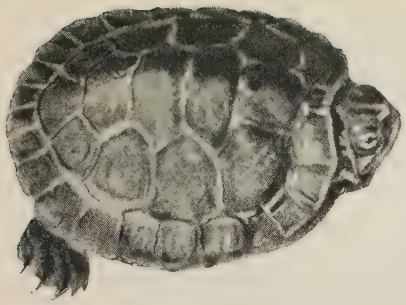
Within the canyons of the desert mountains are found other species of annuals, which, because they must have a greater share of moisture, do not venture out on the level desert wastes. Of these, the desert satin star, *Mentzelia involucrata,* is easily the queen. Of the blazing star family, it upholds the traditions of that group for distinctive form and attractive qualities. Its satiny flowers are not equalled in all the desert flora in exquisite texture and dainty tinting. Painted Canyon and other gorges in the mountains north of Mecca, California, are its favorite dwelling places.

In the canyons just mentioned is also found the desert aster—superlative one of all western composites bearing the much-used name of "aster,"—lavender-rayed, with yellow center, and two or three inches across. And with just enough irregularity in form to give it an air which we can only satisfactorily describe as *chic.* It is a perennial, with a low woody base, a generous annual growth of slender herbaceous branches, and a liberal dower of foliage. The botanists call it *Xylorrhiza* and try to make several species of it,—basing the distinctions upon some slight differences in the form of the leaves. I have seen it growing in various places from Nevada to Mexico, however, and have noted the gradual change in foliage, from the sparse, somewhat twisted, slender-leaved form, which is found in the northern part of its range, to the wider shaped straighter form and more generous growth common to the South. But throughout its range, the flower remains practically the same in size, shape, and pose. It is a little more deeply colored in the South, that is all.

Of the many pictures of this charming desert aster that are enshrined in my memory, there are two which grow brighter and brighter with the passing years. One is where the flower grew in profusion on the face of a rocky cliff bordering that acme of drabness, Death Valley. And the other had its original in Painted Canyon, in the heart of the Colorado desert, where leafy clumps of the aster ringed the base of the high and almost perpendicular sandstone walls.

Many other floral dwellers of the desert are worthy of the highest praise. Among them are several shrubs and trees, which in their seasons, are bewitching bowers of bloom,—the palo verde, with its cloud of yellow; the smoke tree, a solid mass of dark-blue; the mesquite, hazy with fringy catkins of yellow-green; the desert willow, charming and attractive in a dress of pink-and-lavender; the scarlet chuparosa, and the white-leaved, yellow-flowered brittle-bush, or golden hills. There are others a-plenty,—the ocotillo, "candle-bush" of the natives, most striking and unique of the Colorado desert flora, and the yuccas, with the Spanish bayonet, glorious of bloom, and the Joshua tree, that grotesque plant creation which the Mojave Desert claims as its most distinctive feature, acting as the leading representative.

Thus does desolation bring forth beauty, and endless sand dunes lose their drabness, when the desert blooms.

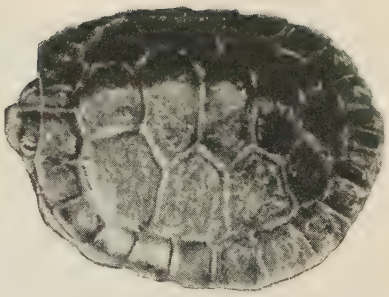


JUST SIX MONTHS OLD
*This inhabitant of ponds and brackish waters has considerable growing yet to do*

# YELLOW BELLIED DELIAS

## A Tale of Florida Terrapins

by Lucy C. R. Ferguson

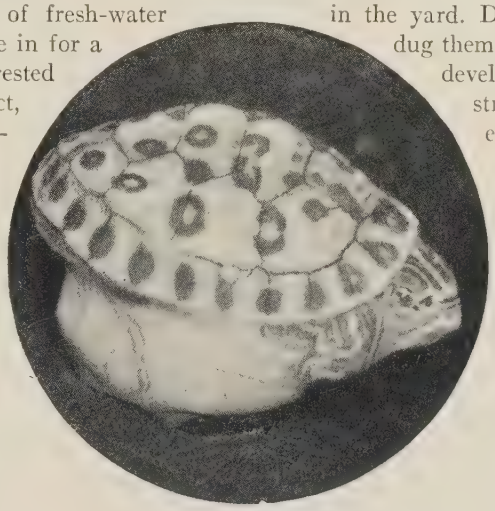


A MODEST FELLOW
*It's most difficult to catch one of the Florida terrapins. They avoid all publicity*

SINCE the days of Aesop there has been more than a passing interest in the strange creature that carries its house on its back and lives only in the sea—the turtle. And with the meeting of the first epicure and the first terrapin, an inhabitant of fresh-water ponds, the turtle's cousin has come in for a great deal of not entirely disinterested attention, considerably more, in fact, than that bestowed upon the land-lubber relation—the tortoise.

Down in Florida and southern Georgia lives a member of the family, the yellow-bellied Delia, as the natives call him, or the Florida terrapin, as correct nomenclature demands. Not as delectable as the diamond back, he is palatable; but really the most fun is to watch him rather than to eat him.

The lakes and ponds are full of his brothers and sisters, and they can be seen on bright sunny days, drowsing and sunning on old logs, or on the banks. They are difficult to approach; even the sleepy alligator, wary as he is, permits closer scrutiny than the "pond sliders".

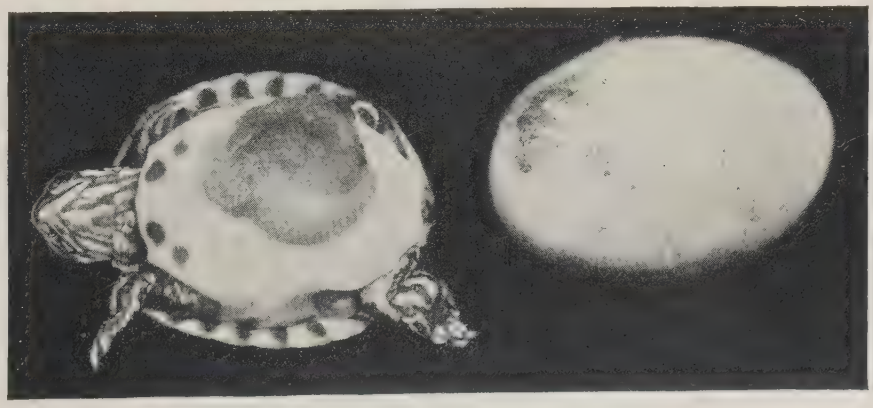


WHEN THE SHELL WAS OPENED
*The embryo, completely formed, still possessed part of the yolk, on which it fed*

In May, the laying season commences. The terrapins dig their nests close to the ponds in the hammock lands, or else climb the flanking dunes to lay in the dry white sands. A great number of the nests are discovered and destroyed every spring by raccoons, bears, wild hogs, and crows. I have seen even a king snake coiled around a violated nest, and watched him eat the eggs left or overlooked by the first marauder, swallowing pleasurably.

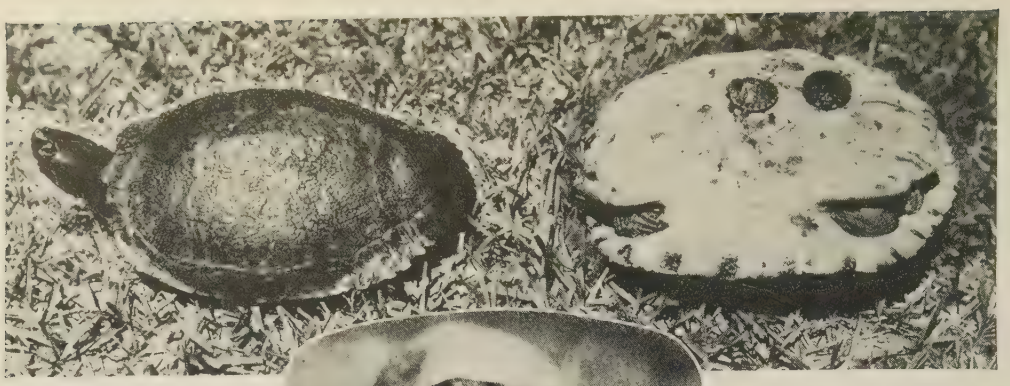
Last spring I dug up a nest and carefully carried home the fifteen oblong leathery-shelled eggs, planting them in the yard. During the period of incubation I dug them up every few weeks to watch their development. Holding them before a strong light, just as one tests chicken eggs, I could see the embryo growing. For six weeks the development was slow, but by the end of the eighth week the entire terrapin could be clearly discerned. At the last testing on the seventy-second day, an active and lively infant filled the shell. As an experiment an egg was carefully opened; the yolk which feeds the growing embryo had not been entirely absorbed. The little terrapin was then wrapped in damp gauze and put near the kitchen stove. Twenty-four hours later the yolk was half the size of the previous day, and the shell had straightened and hardened somewhat. The little fellow was photographed again to show the yolk absorption, this time next to an unhatched egg. At the end of forty-eight hours only a small piece of the yolk remained, and this gradually dried up and disappeared.

It was not until the seventy-sixth day that the first egg hatched of its own accord. A few hours later a second terrapin appeared, but four more days passed before

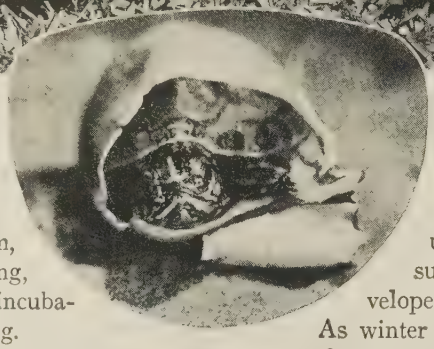


THE YOLK GROWS SMALLER
*Compare with the unhatched egg at the right*

THE EGG WAS SLOW TO HATCH
*The embryo took seventy-six days to develop*



THE GOAL OF THE YOUNGSTERS
*Note the babies on the plastron of the adult. They have a long way to go*



JUST OUT OF THE SHELL
*This terrapin hatched in the usual method. He would not eat for days*

the remaining eggs hatched. Transporting the eggs from their original nest, and digging them up to test them, combined with a rather sunless spring, may have lengthened the period of incubation and caused the irregular hatching.

After a week's time all but four of the healthy and lively lot were liberated. These four were kept in a shallow pan of water and provided with a miniature ladder so that they could climb onto dry land. For nearly a month they were plied with food, all manner of insects, earthworms, and small pieces of raw meat, to no avail. It was not until the middle of August that they suddenly accepted meal worms, and developed large appetites. They grew visibly. As winter approached and the weather became colder, they took less and less interest in their food, lost their liveliness, and only occasionally indulged in gentle exercise around their box, frequently falling sound asleep, their heads stretched to high heaven. And from then until early spring their interest in life was small.

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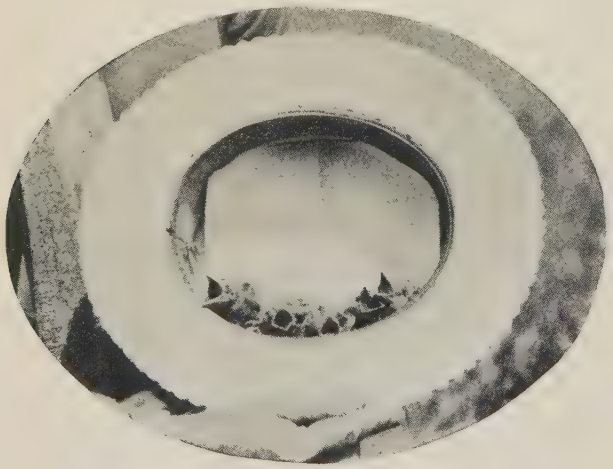


# *MEADOW LARKS*

## They Set Up Housekeeping In The Big City

by Sterling G. Harris

It was April in New York, and above the city smells rose the odor of fresh, damp earth, of early flowers. The grass was turning green, the trees were beginning to rival it, and somehow the pull of the city as it murmured busily was less than during winter storms. And two meadow-larks, imbued with the season and the sun, looked over a back-yard grassy plot in Jackson Heights for another home. They set up housekeeping under a tuft of tall orchard grass.

We were worried. There were cats infesting the neighborhood who didn't like birds, externally. We considered a wire fence, and camouflages, and eternal vigilance. In the meanwhile, the family arrived, and five little wriggling puff balls with gaping mouths decorated the back lot. But the danger was only doubled now. One day the owners looked at the plot, ordered horses and a mower, and were blind to the splashes of yellow of the frantically moving birds. When we returned from work that night, the sward was short-clipped, and we rushed horror-stricken to the spot where the nest had been. But the birds had escaped the clattering blades. The mother hovered calmly over her nest. The young still clamored for food. And the father busily walked about looking for worms, quite unconcerned about the near-tragedy which the day had brought.

# JIMMY *and* JERRY

## They Demanded The Very Best

by Helen Dolman

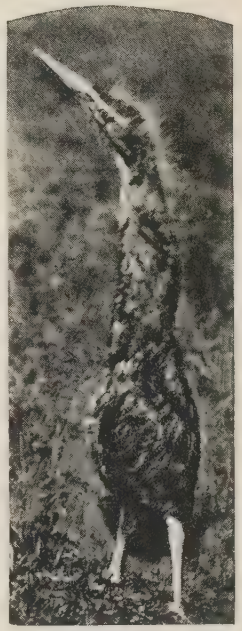
PRESENTING JIMMY AND FEMININE JERRY

*Not so handsome as some, perhaps, but with better dispositions*

THERE they lay in the bottom of the box, two helpless bits of baby bird-dom, the queerest looking youngsters I had ever been asked to help rear. Their long, pale green legs and big fish-eating beaks told me that they were waders, but to one not thoroughly familiar with water birds, the buff down on the homely bodies would give no color-clue as to the species. I lifted them out of the box and put them on the floor. The slender toes, accustomed to grasping the rough marsh grasses, sprawled awkwardly and the large bills seemed to overbalance the slender necks. Though they would never have won a beauty prize, their very dependence won my heart; I adopted them at once and dubbed them Jimmy and Jerry.

"Where did you find them?" I inquired of my student friend who had just placed the box on my desk. Such a gift on a July morning needed an explanation. She told me that these two American bitterns were discovered in the swampy edge of a lake, almost starved and too weak to stand. In a nest of reeds and rushes not far away, three dead bodies bore mute evidence of another tragedy among the wild things. She had brought the little creatures home, thinking perhaps to save their lives, and had fed them upon bread and milk, poked down their unresisting throats. But this morning they would have none of it and she brought them to me for advice.

Now I knew quite well what papa and mama bittern would have fed these infants, but not being a good fisherman myself, and lacking fisherman friends, that diet seemed out of the question. Thinking that we might fool Jimmy and Jerry, however, we opened a thirteen cent can of salmon and offered them some of it. They looked interested but stubbornly closed their beaks after the first bite. Insulted! When we obtained a brand which sold for thirty-eight cents a can, they condescended to eat it and for several days opened wide mouths when they saw a salmon can—of the right price—coming.



A CHARACTERISTIC POSE

*Jerry froze like this when danger was near. Below, the author tries thirty-eight cent salmon, with success*

IN NEED OF MOTHERING

*Jimmy alas, had a low I. Q., which perhaps led to his untimely death. Jerry mourned his passing*

By the end of the week they were able to stand alone and to walk awkwardly across the room. The floor with its hard surface resisted the efforts of their claws to gain a foothold, and they often slipped and went skating as if on skis. When the class laughed at their gymnastics they looked startled at the peculiar noise.

As they grew stronger they also grew more independent and began to leave their salmon meals, so we tried fresh fish from the market. They ate it grudgingly, then not at all. Thinking they were being spoiled

by too much pampering, we opened their mouths and forced it down, only to have them scornfully spit it out. At last they went on a hunger strike,—and we went fishing. All afternoon in the hot sun of an August day, we dipped and seined in the campus pond until we wearily brought our offering of tadpoles to the hungry youngsters. The problem was solved. Tadpole after tadpole disappeared down the ravenous throats until, no longer able to swallow they settled themselves and slept. Thereafter the small boys of the neighborhood were kept busy supplying food for the bitterns.

After a few more feedings by hand, I set the dish of water containing the live tadpoles on the floor and let the birds do their own fishing. Though Jimmy was the larger of the two birds, Jerry was the more intelligent. The dish in which we fed them was glass and Jimmy, seeing the tadpoles through the side of the dish, invariably tried to get them that way. He never seemed to learn by experience, but would peck away at the side of the dish until he saw Jerry successfully capturing them over the side. He would watch her a moment, his head on one side as if wondering why her plan worked better than his, and then follow her example.

ON A FIELD TRIP

*While unable to fly, each bittern was quite curious about what went on in the big, big world*

Jerry also seemed to accept her cage more philosophically than did Jimmy. We allowed them to run around the room or in the garden for awhile each day. When they were returned to their cage Jerry would begin to preen her feathers and to make herself at home. Not so with Jimmy. He would pace up and down, striking the wire with his beak until the end of it actually grew crooked as it hardened.

If a cat or dog came near the cage, Jimmy would take a defensive attitude in front of the cowering Jerry, spreading his wings, drawing back his head and making a peculiar hissing noise. Both of them acted the same way if a stranger came near but they followed us around the building.

Their pin feathers looked like bundles of tiny cigars which unrolled as they pushed out and at the end of five weeks their bodies were covered with the typical brown and white adult plumage. They began to take on grown-up ways. When we released them in the garden for their daily walk they used to stalk over to the bushes with the characteristic undulating gait of the bittern, and if we followed they struck a pose, beaks pointing toward the sky. Instinctively they depended upon their resemblance to a tree branch for protection.

By the time they were six weeks old we decided that they were large enough to care for themselves and planned to take them out to a marsh to release them. Since they had learned to trust human beings we were afraid to risk setting them free near town. The day before the one set for the trip the birds were left out for a few moments in the garden. Hearing a great commotion, I rushed out to find Jimmy lying in a heap on the ground with Jerry standing over him. As I came near, she crouched in front of him, wings spread and hissing. Jimmy's leg had been broken, how, we never knew, and though we set it as best we could and cared for him tenderly, he grew weaker and would not eat. We finally chloroformed him.

While Jimmy lay on the floor of the cage or tried pitifully to move about, Jerry stood nearby and protected him when anyone came to molest. After his death she withdrew to one corner of the cage and stood, shoulders hunched, wings drooping, head upon her breast, a pathetic silent figure, refusing food, rejecting the human aid she had once welcomed. When she, too, died there were those who said that a dog must have hurt her, but I shall always believe that she found life too lonely without her Jimmy. And it might be that I am right.

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# A Queer Elm

by A. G. Buerge

The great West has its sequoias through which auto trails are carved, but it cannot boast of anything more freakish than this elm, which forms an archway over the highway. The elm, when a sapling, was bent over by a falling tree, and the forked top became embedded in the ground. It took root, and grew up at the right. Not content with this, it sent up three trunks from the arch. Thus it has become a four-in-one tree, and one of the strangest sights in the vicinity. Nevertheless, since it is not on a travelled road, not more than ten per cent of the inhabitants of Reed City have seen it, and it grows quite unattended and unadmired. Yet all Michigan has no more unique Nature product than exists in this little town in the Wolverine State.

AT TIMBERLINE IN THE HIGH SIERRA

*Barren? Not at all, to those who love the wilderness in its primitive state*

# *Remnants of Wilderness*

## Shall "Open Spaces" Pass Forever?

by Ward Shepard

*Photographs by Courtesy U. S. Forest Service*

We had dropped at nightfall over a daring and dizzy trail to a lonely mountain meadow high in the Sierra Nevada. In the dusk we unsaddled our horses, unpacked our supplies and blankets from the mules, and turned the animals out, hobbled and belled, to graze in knee-deep grass. Then we gathered firewood, brought water from the stream, and cooked and ate the simple fare of the mountains. Afterward we reclined in the fragrant grass and talked quietly as our fire wove patterns of light on the trunks of firs and pines that were immemorially old.

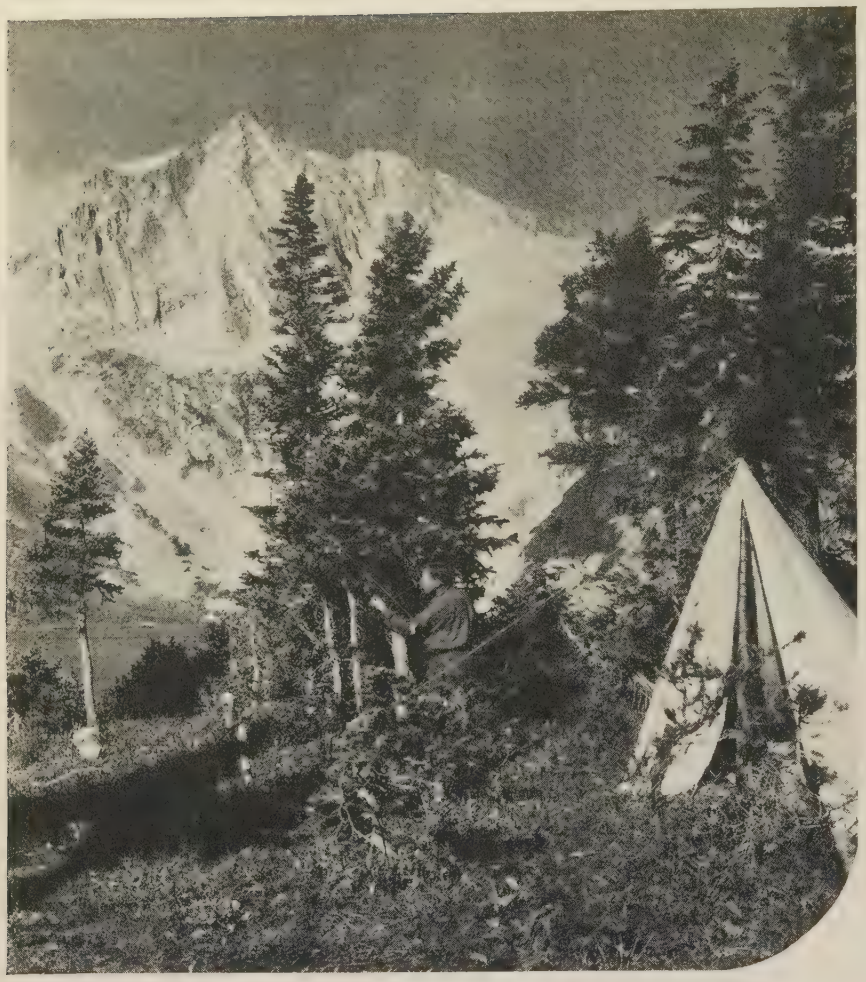
Night and solitude walled us round. The waters of the mountain stream played only a vague accompaniment to the universal silence; the bells of our horses gave out a muffled tinkling; our voices were subdued in the all-engulfing stillness. Above the black outlines of the canyon walls the stars shone brilliantly, for by some trick of the rarefied atmosphere at that high altitude, they seemed to hang beneath the dark purple vault of the sky, and glow warmly just above the tree tops like swarms of fireflies.

*As Mr. Shepard points out in this article, wildernesses are passing. Just as the glaciers of Glacier Park are melting, so that future generations will not see them, so the great, wild tracts where one could completely shake off civilization are disappearing. The people cannot save the glaciers, but they can save the "open spaces". The deserving minority, which is not as small as may on first glance appear, should be the leaders in the movement. The American Nature Association heartily endorses Mr. Shepard's viewpoint, and will be glad to cooperate with all active agencies striving to bring about the desired result. As Mr. Shepard says, "The answer depends on the force and articulateness of the demand for wilderness areas."*

We had come to the wilderness for rest—and we had found it. For months we had been hemmed in by the clamor and hurry of the city, by its prodigal waste of energy and brutal indifference to spiritual repose. In this peaceful spot, as we sat beside our waning fire, the strident metropolis seemed remote and unreal and its restless activity feverish and abnormal compared with the powerful peace of Nature.

In the two weeks ahead of us we should be able to travel the length of several such canyons and camp each night in a fresh unspoiled spot as lovely as this. We thanked the god of good vacations that these wild fastnesses ahead of us had thus far escaped the fate of "development," and that we could disappear so easily from the grinding pressure of man-made events.

"But you can't depend on luck," said my companion, "to keep this kind of country off the road maps. I've been up and down this state for eighteen years and I know considerable country once as wild as this that is now full of motor horns and filling stations. If anyone wants to



THE GLORIES OF THE CAMP
*Near some crystal lake embraced by peaks, where sounds of "civilization" are drowned out*

keep any samples of American wilderness for his descendants, it's my opinion that he had better make his wants known as quickly and loudly as he can."

I had to admit, from what I had seen in my travels as a forest inspector, that he was right. For everywhere the road builders, armed with unlimited money and machinery, are pushing their winding ribbons of stone into the forests and mountains. "Loop roads," "scenic drives," "skyline routes" are invading places that a generation ago were regarded as permanently given over to wildness and solitude. And with the roads come hordes of motors, armies of tourists, and all too often, myriads of "hot-dog" shacks and filling stations and billboards,—and loudspeakers, and telephones, and all the other mechanical effluvia of what is generally called civilization.

Not of course that one can really stop this onrush of the modern spirit. The earth is being subdued to man's will and to the gorgeous toys of the mechanical age. Soon it will have all "modern improvements" from pole to pole, from the upper Orinoco to the basin of the Congo. But there are some remnants of the wilderness still saved from invasion and destruction by modern civilization. In our eastern country, except for a very few spots like the summit of the Adirondacks and the Great Smokies, and the country north of Lake Superior, the wilderness is indeed already gone. But in the West, especially in the National Parks and the National Forests, a surprisingly large amount of country uninhabited and unpenetrated by highways still exists.

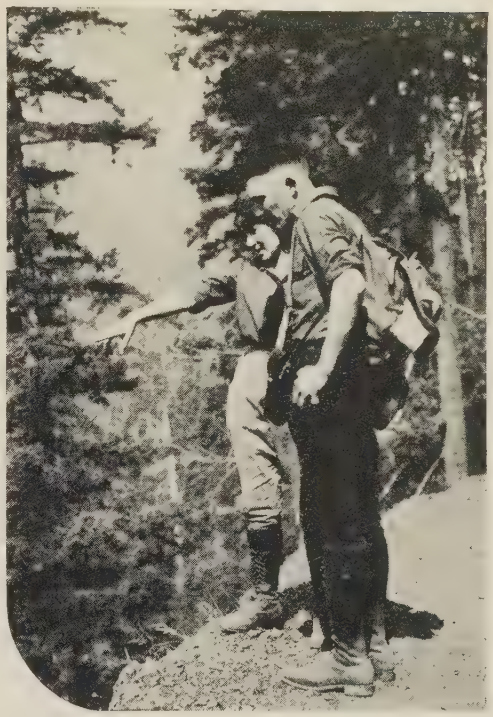
Fortunately much of the remaining wilderness of the West is in public ownership, either as National Forests or National Parks. Being curious to determine just how much real wilderness was left in our vast system of National Forests, the Forest Service has made a careful study of its road system and of the extensive National Forest areas that are still roadless. First it made an arbitrary definition of a wilderness. A real wilderness, it decided, must have spaciousness—enough to permit one to travel on foot or horseback for a week or two without crossing and recrossing one's tracks. It would be difficult to do this in a territory of much less than 360 square miles, and this was chosen as the smallest acceptable wilderness. An area of that size contains nearly a quarter of a million acres and is equivalent to a square about nineteen miles on each side.

With this sizable morsel of "God's country" as a guide, the Forest Service set out on its thrilling pursuit of the wilderness. It wasn't a matter, though, of sending out expeditions to explore the National Forest hinterland. On the contrary, all that was needed for the moment was a painstaking study of road maps; but this seemingly dull job yielded some surprising results.

The study showed that there are still left within the National Forests seventy-four roadless areas ranging from the minimum size of three hundred and sixty square miles up to nearly eleven thousand square miles. Imagine a square more than a hundred miles on a side without a road and almost without a habitation and you will have some conception of the largest of these tracts.

Here, then, are wilderness areas worth reckoning with. The situation is not as bad as had been feared. And cautiously the Forest Service is working out a plan to preserve some of the most suitable of them in their primitive state. Fortunately, many of them lend themselves to this purpose without serious conflict with other possible uses. For by a process of natural selection, the road builders proceed from the easy to the difficult and usually leave the wildest and most inaccessible and economically least valuable regions without roads until the last. That at least was true in general until the immense program of federal and state road-building demanded by the automobile brought the purely recreational road to the fore.

So, of the seventy-four wilderness areas left within



OVER THE TRACKLESS TRAIL
*"Where shall we go?" Where spirit guides, where Nature is untrammelled, where one can breathe*

the National Forests, it is probable that the majority are of rather low economic value. Most of them are high mountain country, with scattered forests that may in large part always remain commercially inaccessible—a land of challenging peaks, of precipitous escarpments, of granite walls and domes intermingled with rough canyons, wild forested glades, alpine lakes, and flowered mountain meadows.

In most of these National Forest wildernesses, the pressure for economic development is not yet intense and is not likely to become so for a good many years. Summer grazing, to be sure, has long been established in much of the high mountain country; but, properly managed, grazing is perhaps not generally incompatible with the wilderness plan. Much of this wilderness country is not well adapted to lumbering because the forests are difficult of access, often sparse, and needed for watershed protection. In any event, the Forest Service believes that future economic demands must be faced as they arise and dealt with in the light of the Forest Service principle of the greatest good to the greatest number.

If there is a public demand and a social need for wilderness recreation, then many of these wildernesses can doubtless be preserved against more utilitarian demands. Apparently there is no insurmountable legal reason why they can not be. If the changing social needs of the twentieth century demand that at least some remnants of wilderness be kept intact, the organic law which provides that national forests be established apparently gives authority for safeguarding them against other conflicting uses. There is, to be sure, an extremist utilitarian school of thought that believes that every tree must be cut when it matures, that every flower and blade of grass must be turned into mutton, that every ounce of mineral must be extracted from the earth, and that every waterfall and dam site must be equipped with electric turbines. Like all other extremists, however, they over-simplify a complex situation and sometimes forget that "man can not live by bread alone". Varying human needs, including the spiritual, must be provided for.

The immediate threat to the remaining National Forest wildernesses, then, is not lack of legal authority to preserve them, nor the pressure of more utilitarian demands, but the rapid invasion of roads. It is on this danger that the Forest Service is concentrating its present effort. It is working out a policy of withholding roads from areas primarily of wilderness value, unless roads are needed for fire protection or for other urgent reasons, and of withholding permits for recreation structures of any kind within such areas.

But regardless of the official policy of the Forest Service, can such wilderness areas be permanently preserved against other competing demands? The answer depends on the force and articulateness of the demand for wilderness areas. In the present stage of American civilization, the demand for preserving wilderness remnants comes from a minority, but a minority with a well-defined point of view and philosophy of life. According to this view the wilderness is a priceless heritage that has had much to do with molding the character of America and that even as a place of recreation will help to instill qualities of independence and self-reliance. But above all these things, the wilderness yields a special quality of pleasure and satisfaction that can be found in only one other part of the globe—the sea. This minority of outspoken wilderness enthusiasts believes there will be a steadily growing demand for natural recreation as the American people continue to cultivate their fondness for outdoor life and become bolder and more independent in their ways of seeking it.

OR LET US HIT THE WATER ROAD
*To pioneer in our own wilderness, free from auto horns and billboards, as did the voyageurs of old*

The preservation of wilderness areas is not a mere theory. In the East, a large section has been successfully preserved under state ownership in the higher and more rugged portion of the Adirondacks.

That numerous majority, "the average man," is perhaps a little skeptical. "Does America need wildernesses?" he asks. "What have modern men to do with these primitive and uncomfortable places? Why turn the clock backward and perpetuate the rude *milieu* of the pioneer and the explorer?"

A surprisingly large number of people, however, like to take their vacation in real wilderness country and with more than a touch of wilderness hardships. After all, it is in the blood. It's the way our ancestors lived; a touch of it now and then is good for the soul and the body. A little toughening up, a little strain on the moral fibre, a little demand on physical hardihood—these are good antidotes for the softening influence of the city. A balanced life demands contrast—and between the real wilderness and the sidewalks of New York the contrast is absolute! I know a physician who, after a strenuous winter of mending broken people, mends himself by a month or two in the wilderness of northern Maine. In Oregon, a girl reporter traversed the wildest length of the summit of the Cascades with only a pack-burro for company. In the lake country of northern Minnesota and southern Canada an increasing number of people seek adventure by the canoe trails and portage. In the Sierras of California, in the Rockies, in the Adirondacks and the Appalachians, in the lake country, in National Forests and National Parks, one meets wilderness travelers by foot, by horseback, and by canoe. To many, Glacier National Park is the favorite park for the very reason that it is the least developed for the handling of the motor tourists and those visitors who are not inclined to take to the back of a horse or hike the mountain trails to discover the unspoiled glories of this playground, which is theirs to enjoy.

Some critics of the wilderness plan have feared that wilderness recreation might be undemocratic and a special privilege for the favored few. No doubt those demanding this type of recreation are likely to remain a minority; but they point out, in reply, that many other types of recreation are provided at public expense for other minorities. Thus, they argue, only a minor fraction of the population make use of public golf links, or of public tennis courts, or of public swimming pools, or of any other one type of recreational facility. So it might be inferred that the test of democracy in such matters is not the number of people who use a given facility but the equality of opportunity to use it.

Compared with other types of travel, wilderness recreation is relatively inexpensive. How can one travel more cheaply than on foot or horseback or by canoe? How can one subsist more inexpensively than on simple camp fare cooked by oneself? How can one lodge at less expense than in a blanket under the stars? Wilderness travel requires things other than money,—a certain measure of hardihood, a love of adventure and a fair degree of skill in living and traveling under primitive conditions.

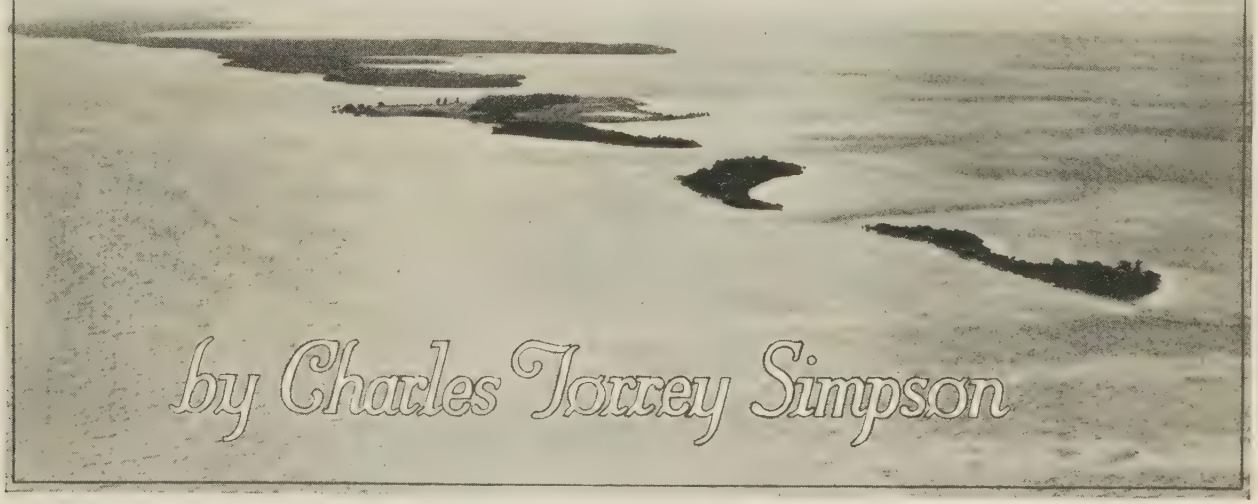
THE THRILL OF THE OPEN SPACES
*They are a minority, the wilderness lovers, but large enough to deserve their heart's desire*

America has taken to outdoor living and outdoor recreation because it is an antidote to the over-sophistication and over-mechanization of modern life. The modern city man is slightly tired of his squirrel-cage existence. He demands a place in the sun, a chance to live at least a fraction of his days, as God intended, outdoors.

Of these things we talked that night in our lonely bivouac in the high Sierra. By and by our fire died down and we wrapped ourselves in our blankets. Round about us everything suggested peace, simplicity, and power. Here Nature was working out her endless cycle of change without haste and without clamor. For aeons the stream had been quietly carving its granite canyon; for endless ages the giant trees, generation after generation, had pushed their spires skyward. Here was the peace of God in its full beauty. Surely a few such remnants of an antique world deserved to be saved forever from the strident clamor, the grind and hustle of the machine age.

# KEYS OF A WONDERLAND

## by Charles Torrey Simpson



R. B. HOIT

WHERE FLORIDA ENDS NATURE BUILT THE REEFS OF CORAL

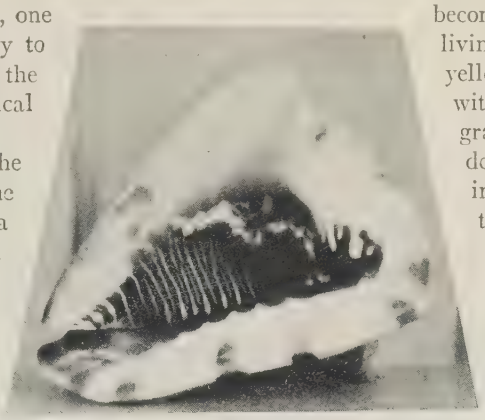
*Extending far into the rainbow sea of many colors, rich in fascinating life—the Florida Keys from the air*

LONG ages ago a reef began to develop near Cape Florida, following the curve of the Gulf Stream down to the south side of Big Pine Key. When it had reached the surface the sea attacked it, tearing up masses of living coral and hurling them back; these were dragged back and forth by storm action until they were broken down and often ground into sand and the whole was cemented into solid reef. This now forms what is called the Florida Keys, and outside of it at a distance of a few miles another reef has formed, now in the very prime of life and beginning to reach the surface in many places. Here, on this outer barrier, one can have an unlimited opportunity to observe, to collect and be amazed at the wonderful development of tropical marine life.

Many years ago I was at the Tortugas, which lie at the extreme western end of the reefs, during a time of exceptionally low tides. In the morning and evening hundreds of acres of staghorn corals were laid bare and stood from a foot to eighteen inches above the water. They were of a rich, reddish brown color, and while some of the arms were nearly horizontal others were erect. Nearby there was a great area of the worked-over reef thickly strewn with broken fragments from the size of a pebble to a half ton's weight and while most of it was covered with water at high tide, it was bare at low tide, save for pools here and there. Whenever I turned over one of these coral blocks a host of minute crabs of a great variety of species scuttled away, red, brown, blue, green, orange or yellow. Many hermit crabs lived in small shells of mollusks, some of which were rare, but it required quick work to catch them for they were away and hid almost the moment they were uncovered.

There were specimens of the "corn pone" a great heart urchin, whose name is especially fit and which becomes eight inches or more long, often living in company with a giant, dirty yellow starfish. This fellow is covered with warts and is a foot across, the granddaddy of all stars. In every depression were sea urchins, living in holes which, it has been supposed, they dissolved out of the rock by an acid secretion, but which Alexander Agassiz says they chisel out with their teeth. It doesn't seem possible! One of these, a Diadema, is an incarnate fiend for about as sure as I ever reached into a crevice or hole for a shell I got stung by its terrible spines which broke off in my flesh and made a bad sore.

If one would clear away the rubbish that accumulates in the hollows of the reef

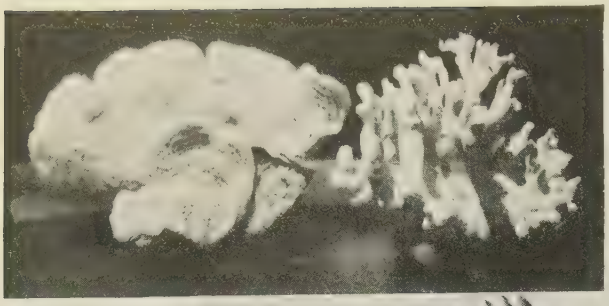


*(Above)* THE HELMET SHELL

*One of the beauties of the reef*

*(Left)* THE EAST COAST LAND CRAB

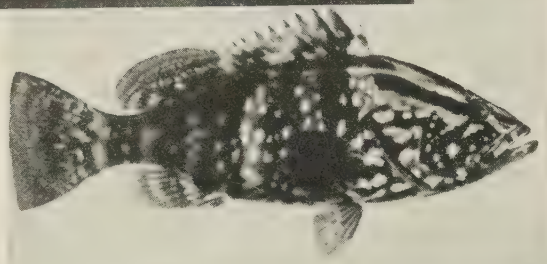
*On the reef there are many tiny crabs*



FROM BENEATH THE WATERS OF FLORIDA'S REEFS

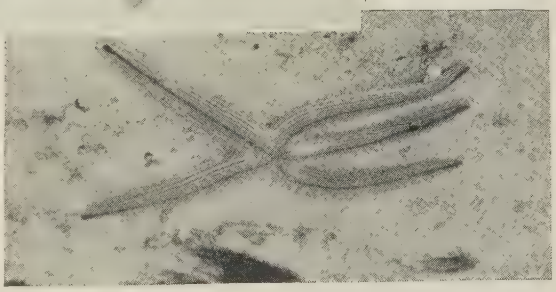
*At the left two types of corals and at the right the thorny oyster which should offer quite a problem to the oyster opener*

PHOTOS BY M. A. ROPER



NASSAU GROUPER AT RIGHT

*And below a starfish snapped in the act of swimming*

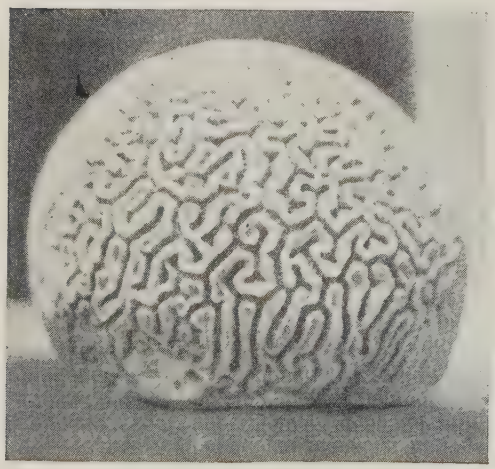


borers. Various sea worms look out from their narrow prisons and open into lovely flower-like forms when undisturbed.

Formerly the best way of going down into the sea was in a suit, but now we have the diving hood or helmet, a large brass cap which covers the head and rests on the shoulders, having a great glass eye in front, and air is pumped down into the top of it from above. With this it is easily possible to work with comfort in water of moderate depth provided one keeps the affair in a reasonably upright position. Years ago I made my first dive with one of these at a little key south of the lower chain in probably fifteen feet of water and in a somewhat open place. When I reached the bottom I saw that everything about me was covered with the most exquisitely delicate vegetation, some of the seaweeds I supposed. Many were elegantly branched with finely cut fronds and all were pale colored. I even thought that some of them were in bloom but I knew that seaweeds do not blossom. Where was I? Could I

one would be apt to find a sort of nest lined with spun threads and within it a lima. It has a pure white bivalve shell and brilliant scarlet animal, while from the mantle hang scores of snake-like tentacles. The Noah's arks, too, will be found hidden away in rock crevices, tied to some solid object by a spun byssus and so covered with trash and sea growth that the most expert fish would never find them. Great tritons, eighteen inches long, with handsomely variegated brown shells and bodies of a strawberry red, lumber along over the irregular floor of the reef and one may find an enormous *Fasciolaria* with a knobbed brown shell and an animal colored much like that of the triton. It is one of the very largest gastropod mollusks in the world, its shell occasionally reaching a length of two feet.

The whole reef, dull and forbidding as it is, swarms with life. Break open any old piece of coral and it is full of a variety of forms, date shells, botulas, choristodons and a half dozen others. Every crevice is filled with the flat-shelled pernas until one wonders how they ever open. If a bit of wood happens to float on to the reef it is riddled with shipworm and other



*(Left)* BRAIN CORAL

*Abundant on the Florida reefs and often several feet in diameter*

*(Right)* A SEA FAN

*Pterogorgia, one of the most beautiful and abundant*

PHOTOS BY M. A. ROPER

MANY ARE FLORIDA'S FASCINATING SEA ANIMALS

*At the left the test of a sea urchin, and at the right is the spiny little live animal*

W. A. MURRILL H. H. SCHRODER

be on Mars or Venus or some other planet where there was a totally different order of vegetation from that of our earth? Then I noticed that along the stems of these plants were little buds or cups and it dawned on my stupid brain that these were not seaweeds at all or any kind of vegetation but hydroids, something closely related to the true corals but having soft bodies.

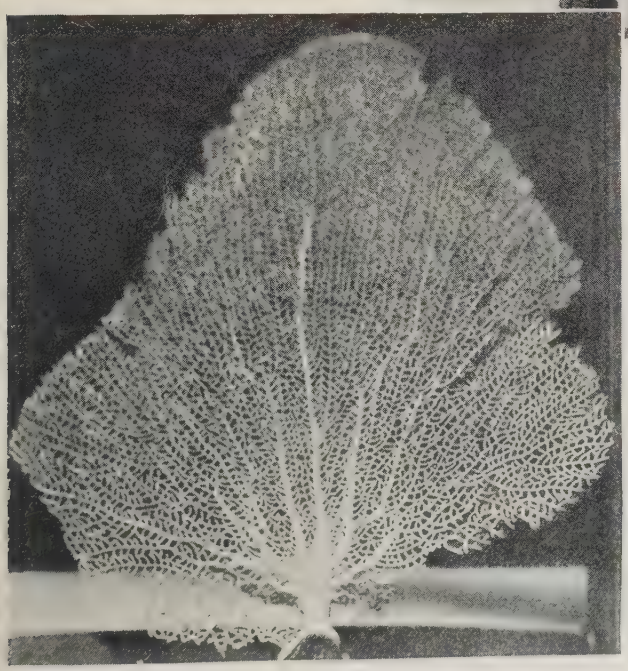
I moved the anchor of the row boat which floated above me so that I could go to where there was a heavy growth of coral which in places rose considerably higher than my head. No language of mine can tell anything about it; the sight was overwhelming. At the bottom resting on white sand were masses of brain corals and a variety of other forms, and among them grew fantastic sponges. With an open space between them two great masses of staghorns stretched up ten feet and, after sending off numerous branches, actually came together forming an incomparable arch. The bottom was gleaming white sand; the water, which seemed so clear from above, was filled with a soft, dreamy haze which did not seem in the least to obstruct the vision. Floating under and beyond the arch were hundreds of dazzlingly brilliant little fishes that seemed to be poised in the water. They slowly drifted along past me and as they went by I made an almost imperceptible move and in the thousandth part of a second every one of them had flashed out of sight. They had, apparently, gone nowhere.

A SPONGE FORM

*These take on a variety of fantastic and beautiful shapes*

The landscape of the reef is marvellous. It is imposing. Corals are piled up in the wildest confusion, they cut the water-sky line with wonderful and startling effect. Ragged cliffs jut out and appear to be magnified, so that they sometimes seem mountain-like. Great chasms open out below that are apparently bottomless and which fill the soul with fear. Everywhere there are springing up the wonderful sea fans, often higher than one's head, either yellow or purple, always light and unbelievably graceful, usually waving as if gently moved by the wind. While the whole effect is almost stunning yet there is something about it so unreal that one can scarcely believe that it exists.

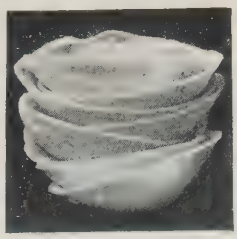
But the glory, the masterpiece, the great source of thrills is the fish. There is astonishing color in the reef and its attached animals, the sea fans, the worms which shine out like stars, the wonderful anemones, blossoms of the sea, a great variety of curious sponges, and other



SEA FAN AND THE SHELL KNOWN AS BUTTERCUP

*The fan, the gorgonia, is one of the loveliest and is found everywhere on the reefs of Florida*

M. A. ROPER W. A. MURRILL



forms of life. But all are pale and of little merit compared with the glorious fishes. There are more than six hundred species of them in Florida and nearly half belong on the Keys and reefs. Of these it is safe to say that more than one hundred are splendidly painted. There are Nassau groupers dressed in white, gray and various shades of brown; rock hinds; mutton fish; schoolmasters, decked out in a half dozen wonderful colors; the blue parrot and the toro, the former a solid blue, the latter entirely a lovely red. There is a group of chaetodons, the butterfly or angel fishes, whose coloring is so simply impossible that one cannot believe it after seeing it. The species have compressed bodies which are short and high, something after the manner of the well-known "pumpkin seeds" of our fresh waters and one of these, the blue angel-fish, which reaches a length of two feet, has the body variegated blue, shading off to red on the hinder fins and the tail, the forward fins and cheeks yellow. But the queen of all, probably one of the most splendid forms of life on this planet is the rock beauty. The body is soft, satiny black, its front part, tail and the hinder edges of the anal and dorsal fins a brilliant gold, the mouth blue and there are touches of red at the gills and on some of the fins. According to the books this fish has not been found in Florida, but after a storm which stirred up the sand of the sea bottom until it filled the gills of millions of fishes I saw hundreds of this rock beauty with countless other kinds thrown up on the beaches above Miami.

One is inclined to ask, "Why this gorgeous color?" I confess I cannot tell why in many cases. Perhaps largely because of the strong, brilliant light and the heat of tropical regions. The shells of certain mollusks along our coast are dull colored at their northern range but brilliant and highly colored where they approach the tropics. Certainly it does seem that such glowing color would reveal their owner's presence to their enemies. Yet much of the reef life is dull and much is concealed. It is a constant fight for life for everything captures and eats something else. Yet every form has some means of defense, of escape or concealment.

Probably some of these highly-colored fishes are not edible and therefore are not molested. Most of them are amazingly swift and are, doubtless, endowed with excellent sight: they generally have some place of refuge or concealment close at hand

I cannot more appropriately close this article than by quoting from Beebe: "Until we have found our way to the surface of some other planet the bottom of the sea will remain the loveliest and strangest place we can imagine. . . . All I ask of each reader is this,—Don't die without having borrowed, stolen, purchased or made a helmet of sorts, to glimpse for yourself this new world. Books, aquaria and glass-bottomed boats are, to such an experience, only what a time-table is to an actual tour, or what a dried, dusty bit of coral in the what-not of the best parlor is to this unsuspected realm of gorgeous life and color existing with us today on the self-same planet Earth."

Truly a wonder-spot is the bottom of the tropical sea.

*This excellent article by Dr. Simpson was originally scheduled for our December, Florida, issue but with space at a premium it was necessary to hold it over for publication this month.*

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# THE WAY *of a* GROUND-HOG

## *And Does He Care for Ice-Cream Cones!*

by Marvin T. Gowen

BILLY is a pet ground-hog which lives in Davidson Park up in the business section of the town of Tullahoma, Tennessee. Some time ago he set up an establishment in the middle of a flower bed, where he still lives happily. The children feed him cabbage leaves, peanuts, popcorn, candy and ice-cream cones, and cry out his popularity.

Mayor W. J. Davidson, the builder of the park and the namesake of Billy, built a wire fence around the flower bed, and Billy steps inside when dogs appear. And from within this fence, Billy greets his friends by running to meet them, standing in proud position as if to say, "Welcome, friends," but it's popcorn and ice-cream which fills his mind.

READY FOR MORE
*One has difficulty in filling this fellow up, but he's worth it*

A popular fellow, this. Everyone in Tullahoma gets down to Davidson Park to see him, and takes his friends. "Billy, have an ice-cream cone?"

"A FULL GROWN RAT WHICH SHE DRAGGED WITH LABOR TO MY DOOR"

# JUST a CAT

by Stephen Haweis

*Illustrated by R. Bruce Horsfall*

MY STUDIO in the Rue Delambre was on the first floor, or, if you prefer it, on the top floor, for there was nothing above it and very little in the shed beneath but old junk. Three sides were glass, painted in the hope of partial privacy, and it was reached by what I then called an outside staircase; today I should describe it as a near-relation to a ladder. Neither the shack nor the ladder were safe, no safer than the sanitation about which, even at this late date, I cannot bear to think. My wooden abode leaned wearily against an aged brick wall and at the top of the ladder a hole gave, to the over-inquisitive, access to the roofs of other studios in which several ill-nourished sons of Apelles with sorrows of their own, painted pictures and devised ingenious means of keeping alive.

The hole to the roof was used habitually by only one resident of our court, a cat which belonged to M. le Marronier, a sculptor of some distinction today who had then just missed the coveted Prix de Rome by no more than a single vote. He was a remarkable man, that sculptor; a gentle dreamer, an idealist, reserved and remote. He spoke sparingly and to very few for he objected to the Anglo-American invasion of the Latin Quarter and he had a dignity which made him difficult to approach, especially for young foreigners as the rest of us were. Seldom came visitors to his door and foreigners never: he was exceedingly French. If we heard his voice it was generally in converse with his cat to whom he spoke on equal, familiar terms. To me the cat was just a cat, whose familiar thump when it dropped on my doorstep from the roof I could recognize at any hour of the day or night. The cat was as remote and unsocial as its master, but it was not less remarkable.

One morning I heard it pass my door with a live, protesting sparrow in its mouth, and following it I thought to deprive the hunter of its prey. I could not do so, of course, but I watched it run across the court to its home and make muffled miaows while it scratched frantically at the door. It had still not killed the sparrow which screamed and fluttered with hopeless, useless courage. But its doom was sealed, of course; I knew that.

M. le Marronier came to the door in his brown working blouse slightly spattered with clay, and the sun set a faint nimbus of gold on his fluffy brown hair. He threw himself into an exaggerated attitude registering astonishment and delight.

"What, my love, success has attended your hunting! What skill! What stealth of foot and speed of claws! Thou art certainly the greatest of all hunters since fleet-footed Diana, and the spoil of the chase is for me, thy friend? *Bon*—I accept it!"

He bent down quickly and took the bird tenderly in his hands and said while he gently arranged its ruffled feathers:

"And thou, little brother, be more careful in future, for all cats are not like Minette: there is not another like her in all the world, *n'est-ce pas,* Minette? So frightened . . . see, Minette, how lovely are its feathers . . . and now fly, you are free. But to remain so requires caution; be more watchful in future!" And the sparrow departed with all possible haste, quite uninjured. The sculptor went back into the studio but through the half-open door I heard him continue his conversation with the cat.

"And now the reward of kill and kindness. Milk it shall be in a lordly dish and sardines from Amient Frères: we shall open a new box for the most beautiful cat in Paris, *mon amour!*"

I could bear it no longer. Fighting the diffidence with which I suffered, I found myself opposite the sculptor's door. The cat was finishing the last of the dainties. I knocked on the door.

"Pardon, *Monsieur,* pardon my intrusion, but your cat," I blurted out, "it is the most marvellous thing I ever saw . . . do tell me."

"Minette is a person, yes, she is remarkable. She is not an ordinary cat, for she was born of wild parents. I took her from the nest in an oak tree far from human habitations in the forest of the Ardennes. It was in

a hole fifteen feet from the ground. I watched for days for a chance when the old ones were both away, for they are dangerous, those *bêtes*. I think the father was a real wildcat and the mother a domestic cat escaped from some village and become wild. There are many there like that. She fought me fiercely too, but became friendly after a while. I worked to win her affection and one day when she was still not much larger than my hand she fought and killed a full grown rat which she dragged with labor to my door; she has courage, that little one. Thus she accepted me. Then she brought me a bird, but I did not wish her to kill the birds."

"But how did you teach her?"

"*Voyons,* the cat can understand a good deal of what I say to her—now, but at first she did not understand French, naturally. But all creatures can comprehend acting if it is simple. When she brought the bird, I acted, as you saw me act for her just now, but then I took out my handkerchief and wept. I sobbed aloud and wrung my hands. I gave her no praise, no reward such as I gave her for the rat. And presently I put the bird into a little box with flowers and dug a hole in the earth. It was an interment with *grande cérémonie.* And Minette saw me do all this and knew I was not pleased. I reproached her all day for what she had done, and she understood. If you take enough trouble they will understand. Never again did she kill a bird, but she kills rats and mice, for which I always reward her. Sometimes she catches birds and lets them go, and sometimes she brings them to me, but always alive and unhurt. For that I always make her a special present for it is hard for a cat to resist the temptation to kill a bird. *Voilà tout!*"

M. le Marronier closed the door of his studio and I went back to my work.

The incident did not lead to any greater intimacy with M. le Marronier, but I am sure his cat treated me henceforward with less clearly defined disdain. Presently I was removed to a hospital and during my absence the police condemned my studio as unfit for human habitation. My effects were removed by friends and I was sent to convalesce among the apple-blossoms of a village near Rambouillet. When I returned to Paris I revisited the cause of my afflictions and found that le Marronier had left his studio also and that the whole courtyard was being dug up to prepare for the building of an apartment house fit for human beings; the artists had all been obliged to move. I

". . . MUFFLED MIAOWS WHILE IT SCRATCHED FRANTICALLY AT THE DOOR"

did not hear of le Marronier for nearly two years, but one day I saw him on the Boulevard Raspail looking very depressed. I did not know if he would remember me, or acknowledge the acquaintance if he did, but I stopped him to ask for news of his cat.

"Ah, I remember; yes, I remember, you knew Minette too, my poor friend. You see me in great sorrow: I have lost my companion of so many happy days, she is dead. They stole her from me."

"They stole your cat!"

"*Ah oui,* and I am heartbroken; it is nearly two months ago now. I live up beyond the Lion de Belfort, it is a very poor district. You know I wished to make pottery, simple, beautiful pottery for the poor people to use, for cooking, for the household many usages, so I went to live among them. We must make sacrifices to be of any use to our fellow-creatures. They are very poor and ignorant in that district and they did not know. I sought for her everywhere, I offered rewards, a hundred francs, two hundred, more, but it was useless. For such a reward everybody in the neighborhood was seeking my Minette, but she was dead. I discovered. I know who it was, but I could not get her back. Of what use a *procès-verbal?* Minette, my beloved, was already dead."

"They killed your cat, for sport?"

There were tears in M. le Marronier's eyes: he wiped them unashamed.

"*Voyons, mon ami,* a man came to me one day and said, 'I ask your pardon—it was I who killed your cat: I cannot bear to have you hope any longer. I ask your pardon.' The people are very poor in my neighborhood: I do what I can for them, but no, they did not kill her maliciously, or for sport. They are poor, they killed her to eat. That is what happened . . . one must make sacrifices!"

# The White Frogs

## Something Strange Under the Sun

by Mrs. Cecil Sarvis

IMAGINE to yourself a creamy white frog, seated upon a lily pad—as beautiful and ornamental as the blossoms near by, or the gold fish flashing in the water beneath! And such a creature is not the product of an idle summer's dream, as the accompanying photograph proves beyond all doubt.

In April, 1927, an embryo biologist of High School age happened upon some albino tadpoles swimming about in a pond with their dark kindred. Realizing that this was something out of the ordinary, he brought home a number of specimens, and placed them in an artificial pool. Lily roots, reeds and the like were planted to provide natural food, and in about two months the metamorphosis took place under the eyes of eager observers.

One of the amusements of the summer was tossing angle worms to them as they sat in various poses of expectancy under the shade of the plants which grew about the pool, waiting for a meal to come. Eight or ten of them used to be in sight at one time.

An entertaining little scene was enacted one morning, after a large "oversize" worm had been dropped in front of one of them.

In just a few moments the frog made his catch, and began swallowing. When about three fourths of the worm had disappeared, it became evident that the frog could hold no more,—and so, with a quarter of the worm still at liberty, he paused for rest—perhaps to ponder as well! Taking immediate advantage of the interval, the worm started crawling out. He had almost gained his liberty, when the captor woke up to the situation and commenced, furiously, to "swallow" again—using his fore feet to shove the worm into his mouth. But the result was the same as before.

About a foot away, under the shade of an alder shoot, sat Froggie No. 2, who now began to take an interest in the struggle of his neighbor. Hopping over and taking hold of the free end of the worm, which still dangled from No. 1's mouth, he pulled valiantly. The result of which assistance was that the worm was transferred "in toto" to the stomach of the earnest helper, who, being a little larger than the other, managed to hold it all. Gorged to the bursting point, this creature made a labored jump into the pool, and stretched himself prone to digest his banquet in utter relaxation, while the interested observer hastened away to procure a form-fitting worm for the victim.

When cold weather came, some of the then plump and well-developed frogs had apparently lost the hibernating instinct, and were caught in the ice and perished. Thus the approach of Spring was awaited with more than the usual impatience, and the pond was anxiously watched to discover if any of the white frogs would reappear.

One bright day in March, the fellow pictured here climbed out on a sunny bank—still quite sluggish, yet very much alive,—the sole survivor of the brood.

# A Novel Hobby

## Breeding Insects As All-Round Sport

by C. F. Greeves Carpenter

*Photographs by Cornelia Clarke*

*This is the first of a series of articles by Mr. Carpenter on breeding and studying insects. The information he supplies is accessible to every child or adult who wishes to spend a little time and effort to obtain it; and fascinating hours are in store for those following his instructions. In this article, the author lays the plans for future conquests, by outlining the equipment needed. Another article next month.*

READY FOR OCCUPANTS
*The lamp chimney home all fixed up*

HAVE you ever seen the miracle of a cabbage butterfly changing from an ugly larva to a delicate creature with wings of velvet? Has it been your privilege to watch a battle between a tarantula hawk and a tarantula, or see the robber fly attack the wheel-back bug?

If you have not, you have missed the thrill which comes with first-hand study of insects. You have lost an understanding of the fascination which the cosmos of little things never fails to throw over those who peer deeply into its workings. Books serve a useful purpose, but at best they are but pale reflections of the life they portray. The beauty of the three-cycled life of insects, the brilliance of their transformations, and the savagery of their battles can be experienced only by the observing individuals who are actually on the scene.

There are philosophers who predict the world of insects will some time conquer the human world. Whether or not this is true, at least their proclivities for destruction are great. But we of the present generation may with safety and pleasure become closely acquainted with them,—we can become collectors and breeders of insects, with little trouble and less expense.

A-collecting, then, we will go, not to come back until we have spoils galore, enough to serve as objects of study for several thrilling weeks. But, as with every move of life, this expedition must first secure the necessary equipment, and articles to receive the booty must be prepared.

It is preferable to have a living collection at first, making a complete study of the life cycle of our captures; then we can build up a pinned one by degrees. Breeding cases are the first adjunct. Six fair-sized flower pots filled with mold and placed on old saucers will serve as bases, and lamp chimneys, covered with cheesecloth secured by rubber bands, will be the daylight prisons for our occupants. Into these we can peer without hindrance, to watch the miracles of life take place.

Now to the field, armed with a few four-inch phials, a dozen match boxes or pill boxes, and a bag. The hunting ground consists of trees and shrubs and their surroundings, and the search will not end until each of the phials and boxes are filled with caterpillars, or, should we be doubly fortunate, with eggs. The eggs are easier to miss, but usually the undersides of leaves, or the inside surfaces of broken pieces of bark, or the holes of trees and telegraph poles will contain a generous

BACK HOME AFTER THE SUCCESSFUL EXPEDITION
*Here are the boxes and phials, the sprigs on which caterpillars and eggs were found, and other impedimenta of our collecting habits*

BEAUTY FROM UGLINESS
*Above is the caterpillar which became the beautiful adult white cabbage butterfly, shown at the right*

PART OF OUR STUDY
*From the chrysalis, above, our mature creature will emerge, to crown our efforts with real success*

supply. Our prizes must not be put away without a leaf or two of the tree or bush from which they were taken, and also a note of the date, locality and name of the host. If the name of the plant is not known, it can be identified later. It is especially necessary that a sprig of the abode of the caterpillars be kept,—it will come in useful later when they are safe in their lamp-chimney homes.

The lids of the boxes containing the eggs must be removed as soon as they are safely home, and the boxes themselves covered with cheesecloth and secured with a rubber band. They should be put in a fairly warm place, and looked at daily until the caterpillars emerge. When this phenomenon has taken place, they are to be housed in the mold in one of the breeding cages, together with a sprig of the plant on which the eggs were found. It should be kept as fresh as possible. Our captured caterpillars should also be treated in the same manner. In this case, all that bear a close resemblance to one another may be put in one cage.

We are now ready for the caterpillars to transform to pupae. They will quite possibly feed for a number of days at first; then one morning we shall find some of them suspended from the sprig. They will not, however, look as we have previously seen them. They will have cut themselves loose from their skin, but remained inside it, and the skin, too, will look different.

They may remain in this state for some time, during which one can observe the wings, segments of the abdomen, and appendages being formed inside. At last the insect is ready to leave its puparium, the old skin is burst asunder, and our mature adult butterfly or moth emerges. If we have several of them we must make a larger cage and let them have plenty of their food plant on which to lay their eggs. Two of these butterflies may be killed for the permanent or pinned collection either by placing them carefully in a jar containing a piece of rag soaked in chloroform, or by gently, but firmly, pinching their bodies just under the wings. Directions for setting them can be secured from the dealer from whom the setting board is purchased.

Leave the butterflies on the board for about three days; then place them on their pins in a cigar box. We may take the box to the museum to see if we can identify the prizes. Some of the eggs from the living specimens should be preserved and some allowed to hatch into caterpillars. At least two of these latter should be killed by immersion in alcohol, the remainder being allowed to pupate, and two of the pupae likewise should be preserved. Thus we have a complete set illustrative of the life-cycle of our insects.

Such pinned collections must be kept carefully and not allowed to get knocked about, for when the insects are dry, they are extremely brittle, and shaking and jarring will quickly break their appendages. A collection of this kind is of far more use and value than a mere collection of butterflies and beetles, as it shows all the transformations through which the various insects pass and, if proper notes have been finely printed and placed under each insect, one sees at a glance the food plant, locality and date captured, number of days in egg state, caterpillar state, pupal and adult stages. In other words, we know then what it feeds on, in what locality and the time of year it was most prolific, and the time expended in the complete cycle from egg to adult.

We have a complete record—and at such a slight cost.

HERE THE PRISONS
*In these, eggs become caterpillars and then butterflies appear*

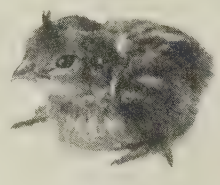
WATCH THEM WELL
*Day by day marvellous changes take place, which we'll watch*

# JAYS OR CALIFORNIA QUAIL?

## Former's Increase Means Death to Game Birds

by Joseph Dixon
*of the University of California*

ONE morning in July, a California quail was calling excitedly *"look-out-there! look out there!"* just outside of my window at the Museum. Investigating the cause of the alarm, I found a mother quail leading her brood of downy chicks from the nest. Some of the youngsters were just out of the egg and were not yet dry. The female led her tender brood slowly along, keeping in the shelter of a row of geranium bushes. Progress of the chicks was very slow. Those that had just hatched were only able to toddle for two or three steps at a time and would then fall forward exhausted.



THE VICTIM
*Jays pounced on him when he uttered a peep*

As soon as I came out into the open the mother uttered excited warning notes and rushed toward me, fluttering wildly about in the grass at my feet in an effort to distract my attention from her precious chicks. The chicks responded instantly to their mother's warning by squatting motionless and sticking their necks out parallel to the surface of the ground. I was surprised to find that the father was just as solicitous as the female for the welfare of his brood. It was a beautiful sight to see the hen leading her unusually large brood of nineteen chicks with the cock bringing up the rear.

I photographed the young, which was difficult owing to their constant activity. The topknot or plume was quite noticeable in these day-old chicks when the feathers on the tops of their heads were spread. Some of those that proved to be males had longer plumes than the others, although the longest was not quite one-fourth of an inch in length.

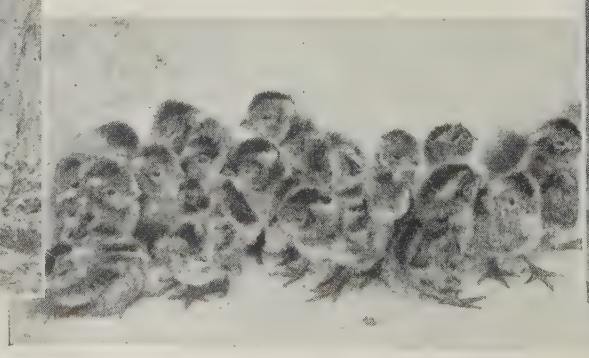
The cock was not content in looking after the youngsters on the ground and in coming up to within four feet of me as I stood watching the flock, but soon flew up and perched in a coast live oak from which vantage point he watched for danger in all directions.

When the excitement had died down, the mother called her chicks to her and began thrashing out a sprig of chick weed. As the minute green leaves were hurled to one side by her beak two of the chicks rushed in and scrambled greedily for the pieces.

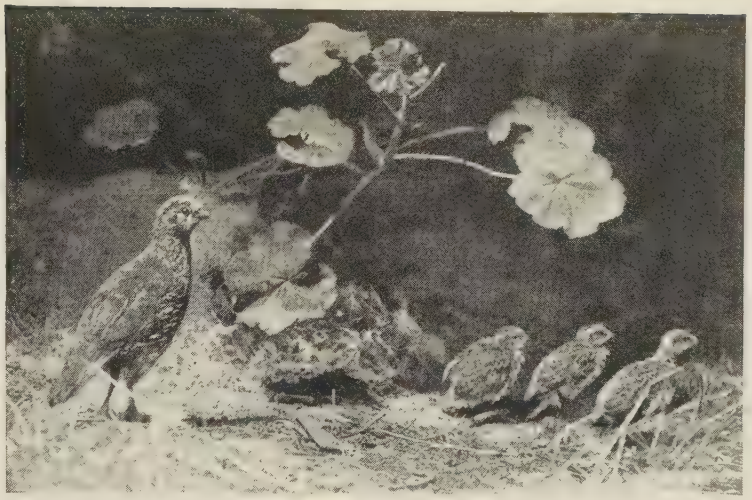
Some of the brood seemed to be missing, however, and wishing to learn what had become of them, I began to search along the row of geraniums that grew beside the Museum. While I was thus watching, an adult California jay hopped out of the geranium bushes about forty feet away, carrying a live chick in its bill. The baby was fluttering feebly and cheeping frantically but could do nothing. The jay flew down and lit upon the hard path. Here it began pecking and hammering the infant to death as it lay helpless on the hard earthen way. I rushed in and tried to rescue the victim from the jay, but he flew around the corner of the building carrying the quail with him. After feeding his own offspring with the remains, the jay returned and hid until another chick cheeped. Then he at once sneaked into the bushes and, locating the young quail by its call note, proceeded to carry it off. This was repeated so that four out of the nineteen young quail were killed by one California jay in fifteen minutes in spite of all my efforts to drive him off. I then secured a gun and shot the jay. In less than half an hour another jay was after the remnants of the brood. We kept a careful watch and found that within a week the jays had succeeded in killing them all, leaving the two old quail chickless.

On August 5, another family of fourteen downy quail were seen with their parents on the grounds of the Men's Faculty Club on the University campus. On

THE FAMILY JAYS DESTROYED
*Neither the cock bird nor the mother, at the right, could save the nineteen little chicks*



ON THE MARCH
*The mother drives her little brood before her, while jays kill stragglers*



BUT HARDLY DRY
*The youngsters could walk but little without stopping to rest*

August 9, I found the family of chicks had been reduced to eight by blue jays which were after them every time they came out from under the sheltering bushes. This cock was also very attentive to the young and, at their first cheep of alarm, would rush in and try to drive off the intruder. Nor were his efforts restricted to his own children, for when another brood of young peeped in alarm, he flew at once to their rescue if within hearing distance. In spite of this watchful care, this brood of fourteen was by August 15 reduced to three chicks.

By August 18 the young quail had grown large enough to be free from attacks of jays. They then spent a good deal of their time taking dust baths and preening their feathers under the watchful eye of their mother.

After thirty years' experience with quail and blue jays in California, it is my conviction that California jays kill more young quail than any other foe. Indeed, California jays are the worst natural enemies of our quail. Fortunately, the jay is outlawed in California and may be killed at any time. I found by actual experiment on my ranch in San Diego county, that a reduction of the jay population resulted in an increase in the quail and, conversely, that when California jays were allowed to breed an appreciable decrease in the quail population consistently followed.

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# *HERCULES, the DESERT TORTOISE*

## He Was A Peculiar Fellow And Did Strange Things

by Celeste Gillette

Slowly and lazily a desert tortoise walked into our yard far from his native home. Many dogs stood around, barking and jumping at him. The turtle paid no attention to the noise around itself. It walked on into our flower garden.

I called the turtle "Hercules".

Now Hercules was frightfully muddy. I carried him into the house to wash him, and he crawled all over the clean tablecloth in the kitchen. I washed him, and polished his shell with olive oil. Fortunately, I didn't put Hercules in water for he would have disliked it. I found that out afterwards.

Hercules' shell was brown with squares all over it. These squares indicate his age, and show he was very old. His feet were the shape of elephants', and everywhere he went he made great marks.

Daddy asked, "Why don't you kill the turtle so we can have some turtle soup"?

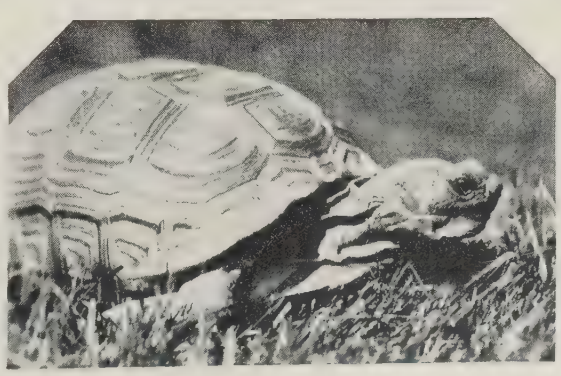
Mother said, "I shall see that this turtle isn't killed".

I fenced in a place in the backyard for the turtle, and made him a box. Hercules was a peculiar fellow. He walked up and down his little yard unaware of any one. There were only three things that he would eat,—lettuce, avocado, and cantaloup. He would not drink any water.

One day after we had fed him, I forgot to shut the door. In walked our dog. Hercules immediately stopped eating and started to hiss. His pink tongue stuck out and his gray eyes showed anger. He looked more like a snake than a turtle.

One day in the spring it rained, and Hercules went into his box. He wouldn't come out again until summer. Then we took him to Grandma's, and she has kept him ever since at her desert home, in Palm Springs.

A CHILD'S PET TORTOISE
*Miss Gillette, the author of this article, who is fourteen years of age, cared for this venerable gentleman of the desert*



Now every day Hercules does a strange thing. He climbs up the steps of the side porch, walks around the edge of the porch once, and then he goes back to his box. We have no idea why he does this. The gardener has to watch him so he will not upset himself when he goes up the steps; for if he gets turned up side down he cannot turn over again, and might die.

# CHIEF POKAGON

## Apostle of Living Beauty

by Edward Allen Hyer

*Chief Pokagon, one of the early leaders of conservation, deserves a lasting place among the redmen who worked to save both their people, the white man and the natural life of the country. His vision was greater than that of those who drove him out. As his picture and his biography show, he was kindliness and gentility itself,—a truly great man. History will acclaim him more than the past.*

SOUTHWESTERN Michigan lay still beneath its coat of ice and wind-blown snow. A white solitude stretched to frozen horizons, soft to the touch but steel-armored. What life there was, was silent. The fearful winter of 1876 held the land in its grip. Even within the bark lodge, in the valley where a glacier had once plowed its way, the voices were hushed, subdued. And now but one voice spoke—spoke in measured tones and in words of seeming prophecy.

"They will not come again. We have seen the last of the great flights of the Mene. A few, yes, that we may not too soon forget what we have destroyed. . . . It was well, and the wish of the Great Spirit, that we should take some of the Mene each season for our needs, that we should save some for the lean months of winter. But even I, who have seen every manner of death, have never seen such slaughter as that of last summer! The great clouds of birds which painted the sky were not ours or the white man's. The few that we could catch, yes. . . . But not all! . . . In every place have I seen the signs of wrath. . . . You! You fools! Did you not follow the white man and learn his evil ways? Did you not lend your aid to the slaughter of the Mene, the pigeons, for his hard, clinking wampum? And what gained you? The wampum of the white man is his. And did it not go back to him? This winter—look! Is there grain stored? Or fish? Was there venison dried? . . . Look! See for yourselves. . . . The aged dying for want of food and warmth. Your children and your women weak for the lack of those things you should have gathered in the months of plenty. . . . 'Help us slay the pigeons and we will pay you well!' . . . Bah! Indeed you are paid.

"No, the pigeons are gone and I sometimes think you, too—pot hunters! Bah! . . . You may look until your eyes water in the wind but you will not see the gray clouds rise from the southern skies again. None shall again cry, 'The Mene! The Mene! The Mene-wog!'—I, Pokagon, your chief, have spoken."

Turning from the group he had addressed the chief strode stiffly to the crude doorway of the lodge, stooped and passed through; paused to slip on his deer-hide webs, and tramped off into the sparkling February night, alone with and a part of the silent wilderness.

* * *

A strange man was this Simon Pokagon, full-blooded and **hereditary chieftain** of the Pokagon band of the Pottawattamie, which were a branch of the Algonquins of the Great Lake region. It was his father, Leopold Pokagon, who entered national history as the Indian who was dickered out of the site of Chicago for three cents an acre.

Simon was born in an Indian village near St. Josephs, Michigan, in 1830, and died January 27, 1899, but a few miles from his birthplace. When he was fourteen years old he could speak but one language, the Pottawattamie. Then he was sent to Notre Dame school in South Bend, Indiana, for three years. He later went to Oberlin College and also studied at Twinsburg, Ohio. All his life, in contact with the white man, he gained the best which civilization had to offer and scorned the rest.

His love and understanding of the wilderness, of which he was truly a part, finds its best expression in his little book, *Queen of the Woods,* a romance of Indian life, which in reality was the romance of his own life. One cannot scan its pages without being conscious of an undertone of music creeping from between the

lines; here the winds sing of sadness as they sigh through the tall pines, there they subtly change their melody to one of promise.

Pokagon knew that no craftsman can paint better pictures of Nature than she herself. He often pauses in his narrative: "Twilight began to spread its misty curtain o'er the wild. The lake was smooth as polished glass, the shore line and the trees were seen as plainly in the lake as on the land, while in the air above and the lake beneath, bats, like butterflies, flitted about; the swallows in wider circles flew; the night-hawks high above them sailed, rising at times as if to scale the sky, then headlong descending like meteors from above, with a strange hollow sound; while all around the lake the whippoorwills, whose only songs are but their names, a chattering concert gave; and later on, to add new glories to the scene, deep in the lake as heaven is high, appeared the galaxy of glittering stars like diamonds in the vault of blue."

During the earlier part of his life Pokagon had been given more than just reason to be embittered against his white neighbors. As a boy of eight he had seen his tribe driven from their native village and from their inherited lands in northern Indiana by order of Governor Wallace of that state. The white man's liquor killed his only son. Two drunken white men in a boat capsized his daughter's canoe while she was fishing and she was drowned. His wife, Lonidaw, who witnessed the accident from shore, tried unsuccessfully to effect a rescue and was herself brought half-drowned to the beach by Pokagon's dog. A few weeks afterwards she died of pneumonia contracted from her exposure in the icy waters of the lake.

Yet, in spite of his tragic experiences, in spite of indignities and injustice, Pokagon deliberately adhered to an attitude of friendliness and cooperation with the settlers. He was a peacemaker of the primitive. He steadfastly refused to believe that the many examples of greed and oppression which he witnessed were typical of the white race. And in the end he won not only the respect and admiration of the white man, but also a complete vindication of his policies in the eyes of his fellow tribesmen of the "dusky brow".

Always a kindliness, indulgence, and deep love of life in all of its forms welled from the profound depths of his mind. He was a spiritual kin to that tall, bearded and sorrowing man in Washington who in the early sixties of the last century Pokagon came to know as a friend. It was through the initial aid of Lincoln and subsequently of President Grant that he obtained from the U. S. Government a part of the long overdue payment for the lands sold by his father.

During the latter years of his life Chief Pokagon became internationally known as a writer, poet, and lecturer. He not only recorded many beautiful Indian legends which gave to an alien race an insight into the mind of the red man, the finest of the red men, but he worked persistently and fervently against the evils wrought among his people by the "fire water" of the white trader.

In 1893 Pokagon was present at the opening of the World's Fair in

THE CRY OF A LOST NATION

*Pokagon's book is one of the redman's masterpieces*

POKAGON FEARED SUCH SCENES

*The wilderness passes, making way for barren slopes*

Chicago. He saw places of honor on the great platform accorded to aliens and strangers from every land while he and his followers, the only true Americans, stood in the background, unnoticed and unprovided-for spectators. This almost broke his heart. As he stood there sadly, a little Indian girl slipped a few wild flowers into his hand. He was so deeply stirred that he wrote *The Red Man's Rebuke* and had it published in a booklet made of birchbark. It was sold at the Indian Village in the Fair Midway and aroused so much interest that the old chieftain was invited to be a guest of the city on Chicago Day. It has been said that no one person contributed more to the interest of "Chicago Day" than did he. For he was the master link between the *Shegog-ong* of the Indians and the Chicago of the white men. Speaking there before the gathered multiude, in part he said:

"Let us not crucify ourselves by going over the bloody trails we have trod in other days, but rather let us look up and rejoice in thankfulness in the present; for out of the storm-cloud of darkness that was around about us we now see helping hands stretched out to aid and strengthen us, above the roar and crash of civilization. . . . We must give up the pursuits of our fathers. We must teach our children to give up the bow and arrow, and in place of the gun, we must take the plow, and live as white men do. The game is gone forever, it is vain to talk of support from game and fish. . . ."

Again, in an address in 1898, near the close of his life, he said, "Tradition, as sacred to us as holy writ, has taught us that our forefathers came to this country from the Atlantic coast. Here they found game in great abundance. The elk, the buffalo, and the deer stood unalarmed before the hunter's bended bow. Fish swarmed the lakes and streams close to the shore. Pigeons, ducks, and geese moved in great clouds through the air, flying so low that they fanned us with their wings; and our boys, whose bows were scarce terror to the crows, would often with their arrows shoot them down.

"But our camp fires have all gone out. Our council fires blaze no more. Our wigwams and they who built them, with their children, have forever disappeared from this beautiful land, and I alone of all the chiefs am permitted to behold it.

"Where cabins and wigwams once stood, now stand churches, schoolhouses, and castles. And where we walked or rode in single file along our winding trails, now locomotives scream like some beast of prey, rushing along their iron tracks, drawing after them long rows of palaces with travelers therein, outstripping the flight of eagles in their course."

And in these few words Pokagon wrote the history of North America for full five hundred years.

Pokagon was a conservationist before the word was coined, a conservationist by inherent inclination. His was the nature that rebelled at useless or excessive destruction, and he lived through the most extended and intense period of wanton consumption of furred, feathered, and forest life in the history of mankind. Those were the days when our natural resources were but chattel and plunder for every man, at a time when he who dared to say "stop!" was swamped by the next wave of plunderers.

Throughout his life up to the very end, up to the "Manito-gis-gis" (Moon of the Spirit, January), in which he died, there flowed a powerful undertone of love of living beauty. He walked his chosen path, and in those dark years of the last century saw beyond immediate needs and greeds. He was one of those few and scattered sparks that survived and glowed, to later burn into the minds of men and emblazon there the words, "Thou shalt not kill wantonly."

And the blaze he started with the aid of other pioneers of conservation kindled into the warm flame of our Audubon Societies, our conservation clubs, and similar organizations; into laws and the courage to enforce them. There followed these pioneers who spoke when there was none to heed a national change of attitude towards our wild life and our forests, and through and because of their initial efforts, there have developed a finer and happier understanding of the wilderness and its inhabitants, a more potent and profitable use for them, and like Chief Pokagon, the Pottawattamie, the white man, too, has grown to an appreciation of living beauty, untrammeled and free.

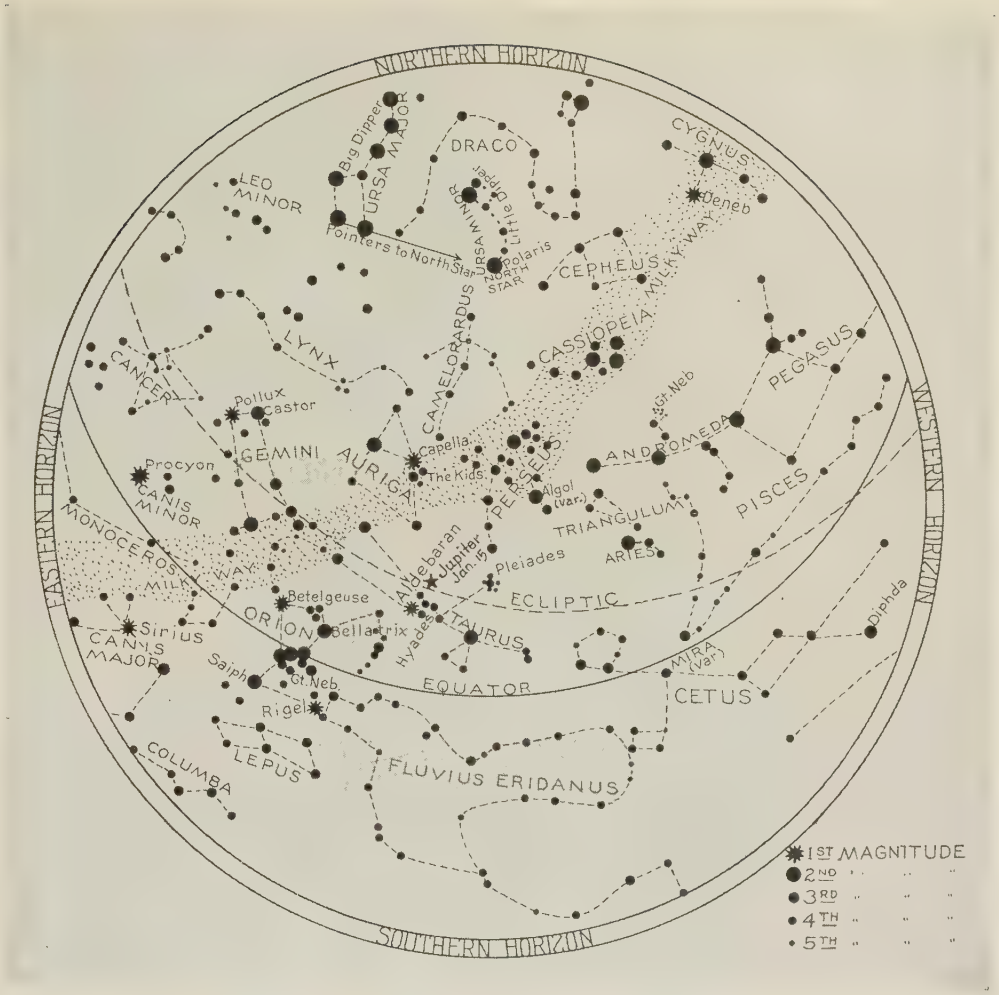
# IN MEMORIAM—

## *A Bird-Bath Tombstone*

IN THE beautiful cemetery at Stockbridge, New Jersey, there are many beautiful stones, flanked by evergreens and well-kept grass, but none more interesting than the bird-bath memorial which stands above the grave of Cecile Bristed Griffith. It stands outlined against a great evergreen hedge, and peering above the top of a lower hedge which surrounds it.

The stone was erected in compliance with the will of Miss Griffith, a lover of the out-of-doors, who requested that the bird bath in her yard be placed on the plot. Her friends deemed it wiser to have an exact replica made, and used instead of the original.

If the only immortality is that of living in the memory of future generations, as many believe, Miss Griffith has achieved it. And the memory will always be associated with her great love of Nature that links us all with our mother, Earth.




TO USE HOLD OVER THE HEAD WITH TOP TOWARD THE NORTH

*This map is designed for use January 1, 9 p.m.; January 15, 8 p.m.; January 31, 7 p.m.*

# MYSTERIES *of the* SKIES

## Astronomical Problems Still Await Solution

by Isabel M. Lewis

THE astronomer of today has made rapid progress in the solution of many problems dealing with the form and structure of the galaxy, or Milky Way, to which our sun belongs, and in the classification of the suns of space as to size, temperature and distribution. He has explored extra-galactic space and made many discoveries. The Magellanic Clouds, the great globular star clusters, the Andromeda Nebula and other "island universes," hundreds of thousands and even millions of light years distant from the earth, have all come under his scrutiny with fruitful results. We now know many facts about dim and distant objects on the outskirts of the visible universe that are hopelessly beyond the reach of the unaided eye; but, only 240,000 miles or so away, that annoying little satellite of ours which refuses to keep to its prescribed path turns always mockingly toward us a pockmarked face whose mystery we cannot solve. The origin of the lunar craters is still in doubt. One may readily find many supporters of the theory that the craters of the moon were formed by the impact of giant meteoric masses in the far distant past, and other just as ardent supporters of the theory that they were caused by tremendous volcanic upheavals.

Dr. Fred Wright has made some remarkably interesting discoveries regarding the nature of the surface rocks of the moon which seem to have some bearing on this problem of the origin of the lunar craters, but this remains still one of the unsolved astronomical puzzles.

Then there is that problem of the length of the Venusian day. Nobody has as yet decisively settled the question whether the planet turns on its axis in a short or long period, though efforts have been made repeatedly

to solve this problem and it is believed to be now only a matter of a few years before the answer will be known. The difficulties have been due to the fact that the planet Venus has no definite surface markings, its dense atmosphere effectually concealing its surface features, though there are some who deny this fact and insist that such markings do exist and that they have seen them. Next to our little satellite, the moon, our sister planet Venus furnishes us with one of the most perplexing of celestial puzzles.

For many years it has been assumed that the outer planets are nearly if not quite gaseous throughout. It has even been suggested that Jupiter may be a semi-sun furnishing its satellites with an appreciable amount of heat, but Dr. Coblentz upset all this a few years ago when he found from radiometric measures of the outer planets that they have surface temperatures somewhere around–140° Centigrade. It is now believed possible that the dense atmospheres of these planets may consist of condensed particles of carbon dioxide or other substances that boil at sub-zero temperatures and that they may have small, solid cores surrounded by layers of ice covered in turn by dense gaseous vapors. Jupiter is undoubtedly the most interesting of the planets to observe telescopically. Changes are always taking place in its atmosphere and its great red spot and tropical disturbances are always an unfailing source of interest. The atmospheric phenomena of the planet have been particularly active for the past few years and the planet is now at its best for observation in the evening. Even a small telescope will show many of its most interesting features such as the four historic moons and the ever-changing phenomena of the equatorial belts.

There is also that old problem of the nature of the canals of Mars. At last their objective reality appears to have been conceded by practically all of the opponents of Dr. Lowell's theories, more than a decade after his death. The remarkable photographs and drawings of the planet made by Drs. Wright and Trumpler at the Lick Observatory, as well as the work of Drs. Slipher, Lampland and Coblentz at the Lowell Observatory and Dr. W. H. Pickering on the island of Jamaica have convinced even the most sceptical that life on Mars is a probability rather than a possibility. There is still the problem of the origin of the canals. Whether they are of artificial origin, the work of intelligent beings, or are produced by natural causes such as seasonal storms and floods is another unsolved puzzle.

All of these problems are connected with bodies in our own solar system. We will mention but one exterior to it, the problem of the origin of that greatest of all catastrophes, the outburst of a nova. It is now certain that every star must at some time in its existence have experienced this catastrophe. Some possibly have experienced it several times. Our own sun, therefore, has probably passed through the nova stage at some time in its past, and may do so again in the future. The cause of the outburst of a nova is an unsolved problem so far. A sudden tremendous increase of radiation seems to be the immediate cause of the catastrophe and this in turn may be caused by the release of energy locked up in the atoms within the interior of the star or by a collision with some other celestial object. A wandering body no greater in size than an asteroid would be capable of causing the mischief, as Prof. W. H. Pickering has pointed out, and there must be many such celestial tramps in interstellar space travelling singly or in swarms.

The greatest of all celestial problems for us, that of the origin of the solar system, may be intimately connected with this hard problem of the origin of novas. Why, one may ask, might not the outburst of a nova result in the birth of a solar system, the expelled substance furnishing the material needed for the formation of planets and their satellites?

These are but a few of the many celestial puzzles that the astronomer seeks to solve. Some he expects will be at least partially solved in the near future; others may never be solved. Yet today one hesitates to say what is possible and what is impossible. Thirty years ago one would have said it was foolish ever to expect to measure the diameters of the stars, but Michelson's interferometer has made this possible in the case of some of the giant stars. Photographs in infra-red and ultra-violet light, and extremely sensitive devices for measuring the surface temperatures of the planets have revealed many facts about neighboring worlds. Other devices or telescopic accessories, now unknown, may lead to the solution of problems that now seem hopeless. There is no branch of science that offers a more fruitful field for investigation and discovery than astronomy of today.

January evening skies in the northern hemisphere surpass all others in beauty. At no other time of year are there so many stars of first and second magnitude above the horizon at the same time. In the eastern half of the sky we have Capella, closely attended by The Kids, close to the meridian at the time for which the sky map is given. Gemini has climbed half-way up from the horizon to the zenith. To the southwest of Gemini is Orion, facing Taurus, The Bull, on the northwest, and followed by Canis Major and Canis Minor, The Greater and Lesser Dog, readily identified by the Dog Stars, Sirius and Procyon. Andromeda and Pegasus now fill most of the western sky. In the northwest will be found the royal pair Cassiopeia and Cepheus and directly west of Capella, and now nearly overhead, lies Perseus, the legendary hero who plays the part of the rescuer of the maiden Andromeda from the sea monster Cetus, in that great celestial drama which involves these six constellations.

Perseus may be easily identified by the long curved line of stars which is known as the Segment in Perseus and is noted for its fine star clusters, and its remarkably variable star Algol, known as the Demon-Star, which fluctuates in brightness in a period of about three days with the greatest regularity, due to the eclipse of the bright star by a large faint companion star revolving around it. Perseus lies in one of the finest portions of the Milky Way which arches high through the zenith in our latitudes at this time of year. Directly south of Perseus lies that famous cluster of the Pleiades in Taurus and not far away to the southwest their companion group, The Hyades, in the forehead of Taurus, the brilliant red Aldebaran representing his fiery eye. Most of the southern sky, to the south of Taurus, is filled by that long winding line of faint stars which marks the course of the

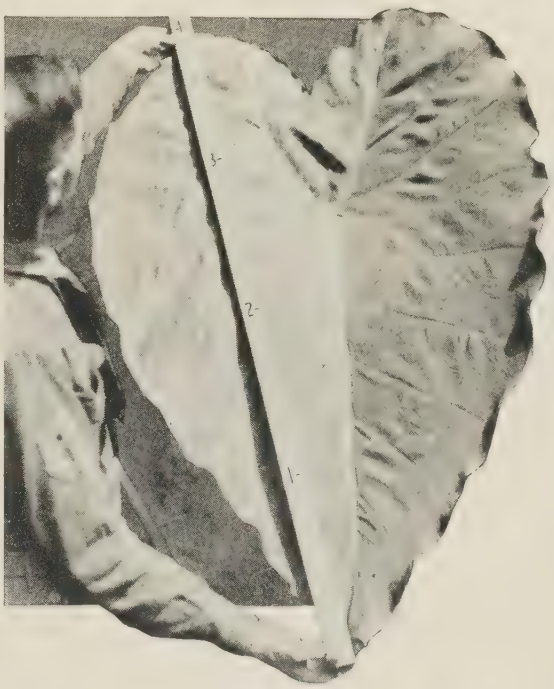
*(Continued on page 58)*

COMPARE WITH THE TWO HUMANS
*Yet the method of culture is contrary to horticultural usage*

# *Elephant Ears*

## Medical Field Service School Claims Championship

by A. B. Nolan



The Medical Field Service School, at Carlisle Barracks, Carlisle, Pennsylvania, claims the record for growing elephant ears, and will place their elephant ears in competition with any other set in the country.

Elephant ears, strange as it may seem, do not grow on elephants, but bloom under the nomenclature of *Caladium esculentum*. They are plants, and what plants!

The crop of the Medical School is spectacular. The individual leaf shown here measured thirty-two and one-half inches in width, and forty-seven and one-half in length—and yet the plant on which it grows is but an infant. The growth measures twenty-seven feet in length, twelve feet in width, and is seven feet ten inches high. The seven bulbs from which it comes were set out on April 20, of this year.

The method of planting and cultivation is quite simple. A trench about three feet deep and two feet wide was dug, and filled with fresh horse manure up to about six inches from the top. Rich loam brought the trench up to ground level. The bulbs were placed slightly below the top level of the added loam, but were not planted until all danger of freezing weather had passed. Even light frosts were guarded against by covering at night. Over-heating was likewise avoided, and the bulbs watered often to prevent burning.

The School will accept all challenges on the subject of elephant ears, to be grown in 1930,—nor does it bar sunny California or Florida. As a side line, it will compete also with anyone on canna lilies. The writer has a bed of one hundred and twenty-five of these that are over seven feet tall. The glowing red President variety is the choice for the 1930 canna record, and is a strong candidate. There is nothing like competition. The School established records without any—think what it could do if pressed.

(Above) THE RECORD ELEPHANT LEAF
*Nearly four feet long and three feet wide, it challenges the world to beat it*

(Right) ALL FROM BUT SEVEN BULBS
*The School, on the strength of this plant, dares all comers to compete next year*

# JUST "MUTT"

## The Story of a Wild Hummingbird Tamed

by Lewis W. Walker

**COMING FOR THE MAN-MADE NECTAR**
*"Mutt", the hummer, visits the flower held by Dr. Auther Wegeforth, his patron and commissary chief*

SEVERAL months ago Dr. Auther Wegeforth decided to try to tame the wild hummingbirds which are so numerous about his garden at San Diego, California. He first tried to attract them by using small thimbles and test tubes filled with a mixture of sugar and water. They seemed afraid of these poor, man-made imitations of flowers and refused to notice the nectar within. Small wooden tubes were then used. They also failed. Soon, however, the hibiscus commenced to bloom profusely, and it was found that the hummingbirds devoured with relish syrup placed in the cuplike blossoms.

At the end of several weeks Dr. Wegeforth, through much patience and unceasing effort, had succeeded in taming the birds to a certain degree. He could now approach to within a foot or so without their being disturbed. As time went on, he stopped filling all the flowers; instead, the syrup was placed in just one or two and then at certain times of the day. The birds soon learned their lunch hour. They started to watch for the Doctor, and would hover nearby whenever he approached or entered his garden. At the end of several more weeks, they would not even wait for him to move away from one of the flowers after filling it; instead, their long tongues would be dipping into the blossom as the man-made nectar was poured from the bottle.

After reaching this stage, he considered he was ready for the final test. Would the hummingbirds come to a flower held in his hand?

He picked one of the red blossoms, and stood close to the hibiscus bush. Mutt, his tamest, appeared like a bullet, hovered for a moment on whirring wings, then disappeared. He returned again just as a bumblebee entered the flower. This seemed too much for him. He was too proud to let an insect show more courage than he had. With a wild dash the bee was dislodged, and the small feathered jewel had taken his place. He looked hesitatingly at the luscious syrup and then greedily devoured it. From then on, the thought of fear in Mutt had completely vanished. He was the king of the garden. He no longer allowed other hummingbirds about his domain.

**QUITE UNAFRAID AND JAUNTY**
*It was only after patient coaxing that the hummingbirds realized who were their friends*

Now he comes at his master's call of, "Here, Mutt, come on, you big bird!" and after eating or drinking, he flies back to a twig on a tree nearby and sings a high squeaky melody. Some of his notes are far too high for the human ear to detect, but the action of his body, throat, and beak let us know he is still singing, and probably about his victory. He has at last found a human he can trust, and his heart is full with the experience.

# THINGS to THINK ABOUT

## A Page Devoted to Matters of Interest to Conservationists

### *Lee Highway Signs*

Last July several members of the staff of the American Nature Association, led by its President, Mr. Arthur Newton Pack, made a trip over the Lee Highway from Washington by way of Warrenton, Luray and Newmarket, Virginia. A hurried list of the outdoor advertising of various kinds along that beautiful scenic route was made, revealing about 175 signs of varying character and origin. This list was the subject of a letter to Governor Byrd of Virginia and the basis of subsequent publicity.

Recently a more careful check has been made of conditions on that highway, showing that there are even more signs, markers and varied types of outdoor advertising to be found on that route than the original list showed. In contradistinction to many other highways, however, this route is less the victim of the General Outdoor Advertising Company and the so-called organized industry than it is the victim of local advertisers—and signs tacked on trees, fences, stumps and the like.

The region into which this highway penetrates is noted for its caverns and its rolling beautiful country. These two items are listed in the order of their importances in the eyes of the owners of the caverns. With no regard whatsoever for the scenic attraction of the country, the owners of Shenandoah Caverns, Luray Caverns, Masanutten Caverns, several hotels,—notably the Panorama,—have plastered the landscape with atrocious signs. The Shenandoah Caverns, in particular, have some signs inexcusably placed from the point of view of public appreciation of lovely scenery, and so far as we are concerned, after having been offended by this sign, we would take a ten-mile detour over a rough road to avoid going near this particular subterranean wonder.

The Chamber of Commerce of Luray has indulged itself in two immense, rickety, commonplace billboards on its outskirts when it might have more effectively used two really attractive town markers. Trees along the route have their usual allotment of garish markers proclaiming the merits of ginger ales, candy, cigarettes, salt, and the customary advance notices of some impossible roadside stand.

The most consistent user of the billboards on the road is the Standard Oil Company of New Jersey, shouting so loudly about Esso that we bought a gas not advertised on the Lee Highway when we stopped to fill the tank. Most of these organized signs, however, are not in strictly scenic locations and remarkable restraint is in evidence in the vicinity of battlefields, like Bull Run.

Virginia has a clean-up job to do on this highway, which soon will be one of the best leading into its most beautiful scenic region. It is a job which demands the education of Virginia people, owners of caverns and hotels, proprietors of roadside stands and owners of property who barter the beauty of their trees for little or nothing. The Virginia State Chamber of Commerce has a committee at work on the problem. The newspapers of the State are awake to the scenic value they have and to the need of preserving it. Something is going to be accomplished in the Old Dominion very soon, and the American Nature Association is happy to be able to play its part in this accomplishment. R. W. W.

### *Texas Mourning Doves*

The doves of Texas, like those of most southern states, have good reason to be called mourning doves. Here is what H. P. Attwater, writing in the Acco Press for October, 1927, has to say of this gentle and harmless bird.

"The mourning dove is one of the most numerous of the vanishing game birds of Texas. To facilitate their killing the State has been divided into two zones. The open season for killing doves in the northern zone commences on September first. On this day thousands of sportsmen and boys start out early to shoot these harmless creatures. Then comes the annual Labor Day holiday. From daylight till dark, hosts of pot-hunters tramp all day in the boiling sun, returning at night with their game bags filled with decomposing doves, many of which have to be thrown away. In dry seasons the thirsty doves, flying for a drink of water, are killed by the hundreds by gunners who conceal themselves near tanks and other watering places, and call it great sport.

"From observations in Texas during the past 25 years, I find that doves nest in June, July and August and that their eggs are frequently found in September and occasionally in October. My notes show that their nesting seasons are often interfered with by hail storms, washing rains and high winds, which blow many of their frail nests with eggs and young out of the trees; that many of them begin nesting again later in the season, and that there are many nests with eggs and young in September. Even under normal conditions young doves in September and October are at a great disadvantage. They are not strong on the wing and are unsuspicious, easily approached and, in many instances not old enough to take care of themselves. Under these circumstances it is obvious that the wild doves are in danger of going the way the wild pigeons went."

This, from the pen of a careful observer, a life-long student and friend of our wild birds and animals, should be read and considered carefully by those who advocate opening the season on mourning doves on the first of September.

### *Seasons for Killing Doves*

We greatly regret, for several reasons, to report an error in the note in the July number, page 58, under the title *Nesting Mourning Doves Suffer*. Here we stated that Georgia was not yet committed to the so-called split season, which authorizes the killing of the birds during September, when many of them are still nesting. This statement is no longer true, for since the note was put in type the State of Georgia, unwilling to be left behind in such matters, has arranged its own shooting season so as to take advantage of the privilege already enjoyed by her sister states under the Federal Regulations. We note further, however, that in Mobile and Baldwin counties, Alabama, which comprise the southern extremity of the State, "to take care of peculiar existing local conditions", the three months open season on doves does not begin until the first of November. We would be interested to learn just what peculiar local conditions are responsible for affording the doves nesting in these counties relief from persecution at a season when their companions in neighboring areas are being sacrificed.

We shall be glad to hear from any of our readers in the South or elsewhere regarding any aspect of this situation. Frankly, we are a little prejudiced in favor of mother doves and their nestlings.

### *A Public Benefactor*

For years the 640-acre tract known as the Fassett holding on the Glacier Point Road in the heart of Yosemite National Park has been a stumbling block to the Park Service. It is a beautiful section, containing all species of forest growth found in the park, a fine meadow and a pretty little stream. To have it cut over or made into a development would have ruined the untrammelled scenic beauty of the entire road. But still the Service did not have money enough to buy it

Due to the generosity of George A. Ball, best known as Vice-President of the Ball Brothers Company of Muncie, Indiana, manufacturers of Mason jars, this tract now rests in the ownership of the government. He paid $8,000 for it and refused even to let the government donate half. It was his contribution to the preservation of Yosemite beauty.

Mr. Ball is well known in his own state and community as a man who is always willing to coöperate toward civic or state improvements. His last act of public benefaction shows that he has the welfare of the entire nation at heart.

Those who pass along the Glacier Point Road will remember Mr. Ball's gift, which assured one section of it, at least, to perpetual naturalness. Unfortunately there are other tracts of private lands in Yosemite that need similar protection, and they will be endangered unless other Mr. Balls step forward. The government has given the Park Service power to make contracts up to $3,000,000, as the funds are matched by private donation, but this power is futile unless public spirited givers show themselves. It is only through the action of friends of the Park Service like Mr. Ball that the intolerable private land situation can be cleared up.

*Beginning with this issue this page will be a regular feature of Nature Magazine and devoted to the constructive report of matters of current importance in the field of conservation.*

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# NATURE NEWS AND Views

### *A Senator Speaks*

"It becomes necessary, therefore, to bring an understanding to our citizenship which will cause it to consider it a crime to rob America of its outdoor lands, and that our nation's welfare and health depend upon the conservation of our woods, waters and wild life." This was the keynote of a recent speech of Senator Harry B. Hawes of Missouri, who went on to say: "More than seven million hunting licenses and fifteen million fishing licenses are issued each year . . . try to imagine this terrific toll in the destruction of wild life! We have been draining our swamp lands and destroying our forests, destroying wild-life refuges. We have been polluting our streams. And we are at the same time destroying human life and shortening our years of usefulness. . . . Scientists have told us that the yearly toll of black bass is so great that this . . . fish is certain to become extinct within ten years unless the states and nation save it. . . . Personally, I think this conservation makes for better citizenship. It preserves some of the frontier spirit of our forefathers. . . . We must bring back, by purchase, as much of the big outdoors as possible, where strong men in spiritual power find their best nourishment." Who says there is no crisis in conservation?

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### *Investigating Ruffed Grouse*

The New England Ruffed Grouse Investigation, sponsored by the Massachusetts Fish and Game Association, is continuing its fourth year of work on the life history of this game bird, giving special emphasis this fall to a study of dispharnyx, one of the most important of its parasites. Reports from interested private investigators indicate that the bird is scarce in most parts of New Hampshire, Massachusetts and Connecticut, but increasing in Maine and Canada. The committee, headed by Alfred O. Gross, at 41 Mt. Vernon Street, Boston, Massachusetts, will appreciate specimens, further reports, and also contributions to enable them to carry on their work.

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### *Scranton Girl Scouts*

The Scranton, Pennsylvania, Girl Scouts are one of the few juvenile groups to publish a magazine entirely devoted to Nature. Their publication, issued monthly and edited by Mrs. Arthur Greener, the second Deputy Commissioner, is entitled *Outdoor Trails,* and carries on its mimeographed pages interesting Nature notes, suggestions for study, and questions. The Scranton scouts have been strong workers for the American Nature Association National Flower campaign, one of them, Miss Susan Cooper, having brought 1500 voters to the polls single handed.

### *A Roadside Achievement*

Traveling east along the Boston Post Road, shortly before you enter the city of Stamford, Connecticut, you come upon a stretch of one-half mile of real beauty. Your attention is inevitably arrested. On one side of the highway, well back, stands a crescent building of attractive architecture and in front a large semicircle of lawn planted with shrubbery and trees which embrace a playing fountain. On the other side stretches another crescent, landscaped with flower gardens of varied design and rich with beauty of color. Can this be some great estate? No, the sign,—small, artistic and in keeping,—tells you that this is the home of the Condé Nast Press, where are printed Mr. Nast's publications and several others, including Nature Magazine.

Perhaps you will speed on, but you must carry along a picture and impression of real beauty. The history of this picture is one of real achievement. Some eight years ago, when Mr. Nast acquired this half-mile stretch and a small printing plant, there was hardly a tree. It was a nest of billboards, poles of various descriptions and rocky waste. Those same years have seen the creation of this garden spot, culminating in the placing under ground of all overhead wires along this stretch. This final event in roadside betterment was commemorated recently when the last ugly telephone pole fell before an axe wielded by Mrs. C. Oliver Iselin of the Garden Club of America. Now this half mile on the Boston Post Road stands as a notable example of roadside beauty and a monument to the vision of an individual and an industry.

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### *Movies and Canada*

The increase in $300,000,000 tourist business from which Canada profits is due to the ways in which moving pictures have "sold" the Dominion, in the opinion of W. H. Robinson, photographer for the Canadian National Railways. He believes that the policy of the railroad leading to the establishment of outdoor film libraries in principal cities, and to their use by groups of Americans and Canadians has been an instrumental factor in directing new interest northward. New films of Jasper Park have just been made, the actors in which are Rocky Mountain sheep, goats, bear, deer and other animals. Other reels, ready for distribution, will display the wonders of our neighboring nation to any organizations interested in the out-of-doors. Inasmuch as Jasper Park is one of the places to be visited by Nature Magazine parties in 1930, this announcement has special interest.

### *Learning About Birds*

The rising generation of Grand Rapids, Michigan, should include a good batch of ornithologists and a large contingent of intelligent bird lovers after the bird study and coloring contest of the Grand Rapids *Herald* has run its course. In this contest attractive prizes are offered by the newspaper to individual youngsters and to schoolrooms for the best showing in coloring the outlined birds published in the newspaper. Special honorable mention will be given, and pins indicating membership in the Herald Bird Club will be awarded. Such contests are extremely helpful in stimulating a Nature interest.

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### *A New Forestry Day*

Indicative of the changed attitude of lumbering concerns is the publication of the St. Paul and Tacoma Lumber Company of Tacoma, Washington, entitled *Growing New Forests,* which forcefully and attractively points out that every national agency must be rallied to grow new forests for the use of the future. "Reforestation is no longer a theory in the Pacific Northwest," the magazine announces. "Not the use of old forests but the growing of the *new,* is the vital question." Excessive taxation and forest fires are labelled the two greatest opponents of successful forest farming. How much progress has been made since the days of Michigan cutting, when not even the soil was left!

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### *Save Wolf River*

The State Conservation Commission of Wisconsin has gone emphatically on record in opposition to the building of further dams in the region of Wolf River in northeastern Wisconsin. The commission contends that further activity of this sort will destroy the beauty of the streams and their surroundings and cause a wholesale destruction of fish life in a territory noted for this life. The commission also goes on record as opposed to any dam building in the state until it can be demonstrated that such destruction of beauty and fish life will not result.

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### *Carrying On*

This brave old apple tree, with half its trunk rotted by disease, still carries on, rejoicing the eye each spring with its beautiful bloom, and later in the summer tempting small boys in the neighborhood to risk colic for its fruit. It has been named "Old Faithful" by Grade Eight of the Halsey School, Lake Forest, Ill., who recently reported that it was still making a strong fight. Perhaps it might be called the Robert Louis Stevenson tree, since he, likewise, wasted by sickness, brought forth beauty for others to enjoy.

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## *Survey of Animal Problems*

Members of the American Nature Association will doubtless be interested to know that a survey of animal problems in National Parks was undertaken, at the invitation of Horace M. Albright, Director of the National Park Service, on July 1, 1929, by Joseph Dixon and George M. Wright. The object of this investigation is to make a survey of animal problems in our various National Parks and to seek means whereby such may be solved. It is proposed that certain outstanding problems, such as the bear and deer problems in Sequoia and Yosemite National Parks, the elk problem in Yellowstone and Yosemite, and the mountain sheep, caribou, wolf, and coyote problems in Mount McKinley, be given major attention at the start.

The relation of predatory animals to other members of the fauna of the parks will be given special attention by Mr. Dixon. Since both of the investigators are members of the committee on economic mammalogy of the American Society of Mammalogists and are much concerned regarding this relation, special emphasis will be placed on this phase of the work.

Mr. Wright, a graduate of the School of Forestry of the University of California, is keenly interested in the ecology of plant life in the parks. As an illustration of one of the problems in this line, we may cite the fact that in several well-known instances in Yosemite the meadows are being encroached upon extensively by a vigorous growth of young yellow pines, with consequent changes in the animal life of the meadows.

Problems arising through the increasing human occupancy of our national parks and the resultant effect upon the native fauna and flora will also be studied.

This investigation is made possible through the generosity of Mr. Wright, who has assumed the financial responsibility for the work and who, in order to insure the successful completion of the project, has created an independent trust fund under which the work is to be carried out. Headquarters and office for the survey will be maintained at Berkeley, California.

Mr. Wright retains his connection with the National Park Service and is to be its representative in all official matters, with title as Scientific Aide in Investigation. Mr. Dixon retains his title and position as Economic Mammalogist in the Museum of Vertebrate Zoology, University of California. Mr. Dixon and Mr. Wright both expect to concentrate their energies upon the objectives above outlined; they have therefore been granted freedom from their routine duties in the University and in the National Park Service, respectively.

It is planned that facts and conditions as found by personal contact with the living animals in their natural habitats in the parks will be illustrated by a series of both still and motion pictures. Specimens of plants and animals will be collected to insure identification in doubtful cases. It is hoped that the facts thus ascertained will also be useful in the general program for increased activity in the educational work and in the management of animal life in the various national parks.

Full presentation of facts as found, together with recommendations for administrative action, as the work progresses, has been asked for by Director Albright.

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# NATURE IN PRINT

### *John James Audubon*

One of the most fascinating characters in American history is John James Audubon. His impress left upon the history of Nature in the United States is, of course, deep and significant. His works live after him and are cherished and sought by many. But the life of Audubon was lived in troublous times and he worked in the face of great obstacles and against a background of vital interest. Audubon the man, the pioneer, are of almost equal interest with Audubon the artist and the naturalist. These things Edward A. Muschamp has recognized most admirably in his book *Audacious Audubon* just published by Brentano. It is a biography with a broad appeal, and its author has imparted to his writing a sensitive appreciation of the time and tide of Audubon's day. The book is priced at $3.50.

### *What of the Universe?*

Space, unfortunately, does not permit our giving a review of length to *The Universe Around Us,* by Sir James Jeans, one of the most distinguished of our contemporary scientists. It is futile, therefore, to attempt to discuss the theories of Sir James as set forth in this volume. It must suffice us here to say that he has presented an uncommonly readable and engrossing story of the universe, tracing the development of knowledge about it, digesting the theories of those who attempt to solve some of the mysteries which still confront us and presenting his own views in many instances. Sir James has a remarkable style which opens the pages of his books to the layman, a rare faculty for simple yet comprehensive explanation. We earnestly recommend this book to those who use their heads to think with and who at any time are prone to speculate about the whys and wherefores of the universe. The publishers are The Macmillan Company and the price of the book is $4.50.

### *Sky Field Book*

To its excellent group of Field Books G. P. Putnam's Sons of New York have added a new volume in *Field Book of the Skies,* by William T. Olcott. It is a presentation of the main facts of modern astronomy and designed to be of practical use to the observer. It is prepared for those who know nothing of astronomy and to teach the beginner how to identify the constellations and the individual stars, and, at the same time, to offer the more experienced observer a practical field book with charts. Finally, the volume seeks to stimulate both a general interest in astronomy and special observation work. It is listed at $3.50.

### *They Surely Are*

Out in Santa Barbara there is a publisher,—one Wallace Hebberd,—who has a knack of selecting different and entertaining manuscripts, putting them in fascinating dress and publishing them. He has just done another under the title of *Teachers Are People.* It is the work of Virginia Church, with a foreword by Rupert Hughes and art by Eulalie. It is a collection of poems that everyone who has been to school will enjoy. That provides a large market. It costs $2.

### *Zoologically Speaking*

W. Reid Blair is director and general curator of the New York Zoological Park and as such is eminently qualified to write *In the Zoo,* just published by Charles Scribner's Sons. For twenty-seven years the author has observed the life and habits of wild animals in confinement and these years of experience provide the material for this interesting and entertaining volume. Most of us delight in at least an annual visit to the nearest Zoological Park and Mr. Blair's book will give new interest to the next visit. For the individual far from a Zoo it is as good as a visit, so filled with illustration, anecdote and information is this volume. It is listed at $2.50.

### *Burgess Again*

The Burgess legend is growing with the publication of each new book, and some day, we hope, it will completely supplant the horrible tales which the Grimm brothers concocted for the awe of children at night. Many long anxious evenings have been spent in nearly every household twenty years back, wondering whether or not the ogre was going to cut off the fair damsel's head; and beside these fearsome stories, the wholesome Nature adventures of Thornton Burgess are as restful and beautiful as a sunset compared with a typhoon. All of which leads us to say that the latest, the Burgess *Seashore Book for Children,* published by Little, Brown and Company for $3, will delight the heart of any child, inform him of the beauties of the lives of small animals, and teach him love and kindness instead of, as the older book had it, fear and hate.

### *The General Electric*

Steinmetz on the one hand, Coffin on the other—how much have these two alone contributed to the romantic history of the electrical industry in this country! Scientific achievement linked with corporate accomplishment in the development of the General Electric Company constitutes an important phase of today's economic situation. This story is told, ably, simply and engrossingly in *Forty Years with General Electric* by John T. Broderick. It is a distinctly fascinating volume to read beneath the light of the lamp with its tungsten filament, while the radio (tuned down) brings in soft melody and while the electric refrigerator hums inaudibly in the kitchen. It gives life and significance to all these things around that we take as matters of course. The book is published by Fort Orange Press, Albany, New York, and sells for $2.50.

### *California*

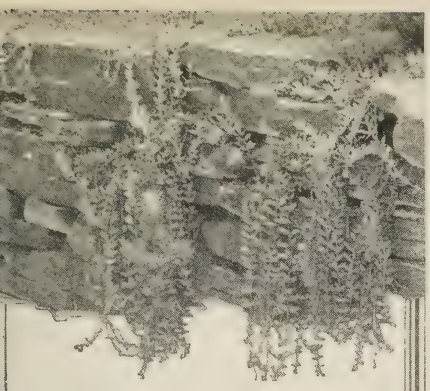
California has been very fortunate in having a literature all of her own—and one inestimably superior to the literature which other states enjoy. The California series of books published by Powell Publishing Company include such books as *Pathfinders, Spanish Arcadia, Gold Days, The Great Trek, Songs and Stories,* and *Oxcart to Airplane,* by such writers and compilers as Owen Cockran Coy, Edwin Markham, Robert Glass Cleland and Frank J. Taylor. The series is just begun, and before it is finished, the publishers hope to present every aspect of the state. The latest book in the valuable group is *Outdoor Heritage,* by Harold Child Bryant, naturalist, teacher, editor, conservationist, chief of Yosemite Nature guides. It may not be as spectacular as its companions, but it lays down the reasons for the romance of California by explaining the state itself. Mr. Bryant deals with the animals, the fossils, the mountain formations, the fish, the playgrounds of his native state not as a too-enthusiastic booster, not as a scientific "paper" writer dedicated to prosaics, but as a man imbued with knowledge both of what is readable and what is true. The book, because of the material contained therein, properly belongs at the head of the series; but irrespective of the place given it by its publishers, it deserves reading not only by Californians the world over, but by natives of other states who can be proud of a wonderful section of North America. The price is $5.

### *Romance and Skies*

The eternal mystery of the heavens will probably cause books by the thousands to be written about it as long as the world shall endure. The romance of it all does not seem to dwindle, no matter how many theories explaining it are given. So the *Romance of the Planets,* written by Mary Proctor, daughter of an astronomer famous for his popular presentation of his subject, probably will be a large seller, since it is written popularly, impresses the reader with the feeling of great space, and touches briefly on the lives of astronomers, their jealousies and their discoveries. The book is easily read, informational, and valuable to one who has not the time to delve in a more completely scientific work. Published by Harpers and Brothers, and priced at $2.50.

### *Wild Honey*

Samuel Scoville, Jr., lawyer and writer on Nature subjects, is always interesting, and his latest book, *Wild Honey,* an Atlantic Monthly Press publication issued by Little, Brown and Company, has not proved to be an exception to the rule. Mr. Scoville is not primarily a naturalist; by vocation he is a lawyer, yet he brings to all his writings a keen power to describe the out-of-doors and its inhabitants in such a way that his productions read like romance. Herein lies his charm—there is nothing prosaic about his work. Even the most common facts gain a glamor from his pen; the most usual, homely incidents become glowing dramas, such as one expects fiction writers to conceive. *Wild Honey* will create new pictures of the out-of-doors. The price is $3.



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# Helps and Hints
## FOR HOME AND GARDEN

*Beginning with the February issue, this department will be edited by Mr. Romaine B. Ware, nationally-known writer on garden subjects. The department will be presented under the general title of "Planting the Garden—Month by Month," and will contain helpful suggestions and directions for the gardener. Mr. Ware's experience in the garden field is nation-wide and his monthly article will be equally general in usefulness.*

Now that the winds are about us, and the snow, it's much more pleasant to sit by the fire and dream about next year's garden, than to get out and be doing. Fortunately, Nature coöperates for once, and all that will call us out-of-doors will be the broken trellises that need mending, mulching, the covering of plants that are liable to freeze, and pruning.

* * *

Of course, there are hot-beds to make, and bulbs to inspect, to make sure they are not rotting, as well as the annual inspection of all the equipment. Be sure that everything is ready for instant use when spring comes. "Show me a man's tools, and I'll tell you what kind of a workman he is."

* * *

The big feature of the month, however, is ordering and planning. No garden stands still—it either goes forward or back. It will have been well if notes have been taken during the summer months. Perhaps in July the color combination did not look right; and a scribble to this effect will enable you to improve it next July. Perhaps you did not have enough evergreens for background. Perhaps it is time to add a water pool, or a rock garden, or rose bed.

* * *

A number of books have lately come out which will not only admirably serve as Christmas gifts for your gardening friends, but also will give suggestions worth following in 1930. A few of them are listed below and may be ordered through Nature Magazine:

*Patio Gardens,* by Helen M. Fox. Macmillan, $6.

*American Plants for American Gardens,* by Edith A. Roberts and Elsa Rehmann. Macmillan, $2.

*Gardening in the Lower South,* by H. Harold Hume. Macmillan, $5.

*Dahlias,* by F. F. Rockwell. Macmillan, $1.

*Lawns,* by F. F. Rockwell. Macmillan, $1.

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*Wild Flowers and Ferns in Their Homes and in Our Gardens,* by Herbert Durand. G. P. Putnam's Sons, $3.50.

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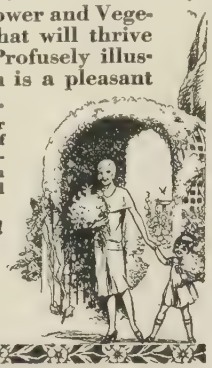

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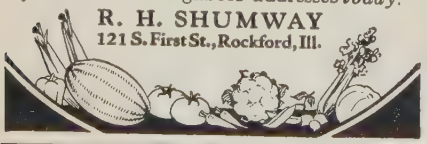

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*The Book of Shrubs,* by Alfred C. Hottes. De La Mare, $3.15.

*Water Gardens and Gold Fish,* by Robert V. Sawyer and Edwin H. Perkins. De La Mare, $1.65.

*City and Suburban Gardening,* by Chesla C. Sherlock. De La Mare, $2.

*Gardening under Glass,* by F. F. Rockwell, revised by T. A. Weston. De La Mare, $2.65.

*Garden Guide*—the Amateur Gardeners' Handbook. De La Mare, up to $1.65.

*The Book of Annuals; the Book of Perennials; A Little Book of Climbing Plants,* all by Alfred C. Hottes. De La Mare, $1.65, $1,65, $1.90.

*Practical Landscape Gardening,* by Robert B. Cridland. De La Mare, $2.65.

*The Book of Water Gardening,* by Peter Bisset. De La Mare, $5.

*Practical Plant Propagation,* by Alfred C. Hottes. De La Mare, $2.15.

*Irises,* by F. F. Rockwell. Macmillan, $1.

The National Garden Association books, *The Garden Library,* which carries with the purchase price the right to call on the association at any time for advice. National Garden Association, Garden City, N. Y. C., $9.35.

These are not all the books that are worth-while, but each one in the list will be a valuable adjunct to the garden library.

* * *

Relative to garden planning, the movement is swinging rapidly toward wild flower gardening and away from the more formal and inartistic "arrangements" of years back. The idea suggested by Mrs. Whitney of a "Rescue the Perishing" garden, made up of plants taken from the sites of excavation or road construction, may be successfully utilized next year.

* * *

It was recommended last year to plant an evergreen or two on the front lawn to serve as a living Christmas tree. If the suggestion was followed, the young tree should be old enough to support a few colored lights. No matter how tiny it is, it will add a wonderful note of jollity to a season in which joy should be unconfined.

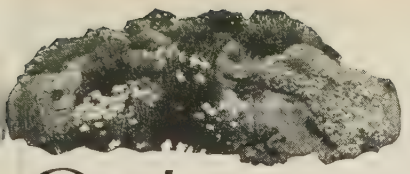
* * *

The gardener's mind is very apt to be poring over ideas for Christmas presents rather than for gardens at this season. Do not forget that garden books, bulbs, shrubs, garden tools, subscriptions to gardening and out-of-door magazines will always be acceptable presents.

* * *

How do plants get their names? Those who have puzzled over scientific nomenclature have often wondered. Here, however, are the sources of a few:

Gladiolus comes from the Latin diminutive of the word for "sword," and so might be called the "sword lily." The rhododendron was named from two Greek words, signifying "rose tree"—a good name, is it not? Phlox is literal Greek for "flame" (from the color of some of the flowers) and corresponds to the German flammenblume, or "flame flower." Aster is literal Latin for "star," and survives in English in asterisk, which is the name for the "star mark" in typography (*). The daisy was named after the sun, or "day's eye," coming from Anglo-Saxon words of that significance. The geranium is "crane's bill," or "stork's bill"



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through Latin from a Greek word meaning "crane." A heliotrope is a flower that, from the Greek derivation of its name, "turns toward the sun"—in other words, it is a botanical sun-dial. Chrysanthemum comes from the Greek words meaning "gold flower."

Then there is marigold, which was named after the Virgin Mary, for its name means "Mary's gold." Other flowers have been named after the Virgin Mary in popular parlance, but the honor is almost forgotten today. For example, there is the lady's slipper, which is merely a shortening of "our lady's slipper," and "our lady" was, of course, the Virgin Mary.

## SNOWFLAKES

*(Continued from page 21)*

actly alike. It is true that in a single storm Nature often uses a very similar pattern; but of a sudden, tiring, she surprises the world by tossing down a snow flake utterly different in all ways from any she has designed before.

Do you live in a northern climate? If so, have you seen those minute daggers of ice, all glittering and sparkling, that fill the winter early air? Too light to fall, they dance with Jack Frost under a clear, blue sky, inviting you to join their merry fun by stamping your feet. The dancers are bits of dust floating in the air. Nature covers these with water, and freezes them into "ice spicules", or "ice needles"; and in capricious mood she stings your cheeks with their sharp points.

Many motifs used in art and industry have come to us straight from the treasure of the snow. Schools of design make use of the crystal's architecture. It may be that your silk gown holds a snow flake's delicately etched markings, for the silk manufacturers call upon the crystal's aid. Many artists have been inspired to use its form and tracings for stained glass windows, or for mosaics. Jewelers frequently copy the snow crystal in filigree and more solid jewelry; metal workers have designed metal grilling from it; decorations for churches and other buildings sometimes owe their origin to the snow flake in all its varied beauty. Perhaps we never realize how great a friend we have in the tiny snow-messenger from the sky.

## *Frogs and Flies*

The statement of a Philadelphia columnist that frogs do not eat flies has elicted reply from William Harper Davis of New York, who says, anent the subject: "Frequently I have seen frogs snap at the brilliant wild flies which buzz among the sedges by the borders of a stream. A frog will snap at anything that shows life. Even frogs which have not taken flies in Nature will take them in an aquarium or vivarium. A tadpole scarcely drops its tail before its relish for flies is displayed. This applies to all the species of frogs I have tried anywhere."


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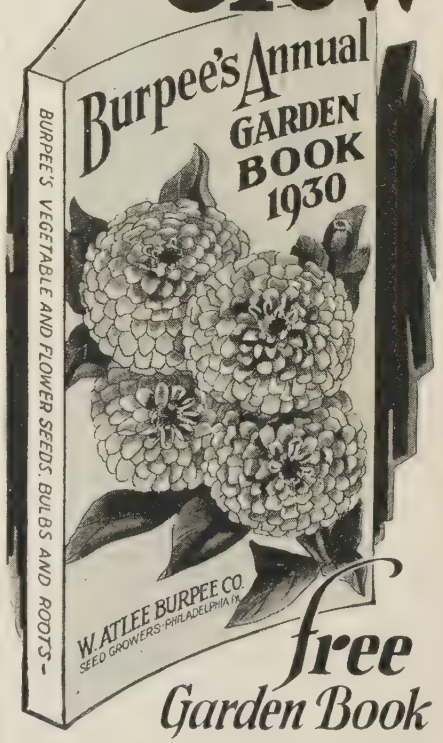


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## MYSTERIES OF THE SKIES

*(Continued from page 48)*

Sky River, Eridanus, which terminates far below our horizon in the brilliant Achernar, which means End-of-the-River.

Among the planets, Venus, Mars and Saturn are all in Sagittarius in the morning sky but too close to the sun to be seen. Jupiter is in Taurus, north of The Hyades and a magnificent object in the evening sky. This is an exceptionally favorable time to view the giant planet and his interesting belts and satellites in the telescope. Mercury reaches greatest eastern elongation on January 5 and may possibly be seen for a few days about this time directly after sunset low in the southwest, but this is not a favorable time to observe this planet.

And so the panorama of the heavens nightly unfolds itself, ever urging us toward the solution of the Great Plan.

### *A Swallowing Feat*

A rather unusual bit of gastronomic acrobatics was witnessed last summer by Miss Elizabeth Smith and her friends near a highway in Idaho. A huge rattlesnake was being swallowed by a much smaller snake, a blue racer, who patiently was enjoying his meal. The rattler was limp and practically dead, while the racer, very much alive, gulped pleasurably, although with difficulty, as he slowly devoured whole his larger adversary.

### *Save the Huckleberry*

The Washington State Society for the Conservation of Wild Flowers and Tree Planting, now having made great progress in the saving of the famous holly of the Webfoot State, assumes the position of godmother over the evergreen huckleberry, which does not grow in any other state except Oregon and California. The plea for moderate cutting, careful and wise selection, and even the complete cessation of gathering should find an answer in the Washingtonians.

### *More Albino Trout*

In the March issue, we told about the eighteen albino trout swimming around in the Ocean Park fish hatchery near Newport, Oregon. C. B. Rychman, the manager, writes us that the eighteen have become 3,000 true albino fry, perfectly white. All crosses with regular brook-trout eggs, however, produced black fry, proving that the albino is a recessive type. Nature Magazine and Mr. Rychman would both appreciate hearing of any like experiments in fish pigmentation.

### *Exchange Specimens*

Mr. James L. Ortega, whose address is R. F. D. 4, Box 171, Santa Ana, California, is interested in getting in touch with residents of Latin-American countries for the purpose of exchanging specimens and notes on natural history.


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### *Miss Dayton Passes*

Miss Dora Dayton, secretary of the Nature Club of Southern California, passed away early in October at her home in Los Angeles, and the entire Nature-loving world will mourn her. She was a beautiful friend both of human beings and the out-of-doors; her type was all too rare. It was only fitting that the Nature Club should conduct services, which took place at the Little Church of the Flowers, at Forest Lawn Cemetery; and it was only fitting, too, that the Club should send to her and its friends an engraving of her last wish—"Let my memorial be an evergreen memory in your hearts." It always will be.

### *Washington Cherries*

The famous Japanese cherry trees around the Tidal Basin in the Nation's Capital, the gift of the Japanese government and still the pride of natives and tourists despite the great damage done them by a deluge in the summer of 1928, are the subject of a dainty Japanese booklet prepared by Masao Yoshikawa, formerly of the Department of Agriculture. The book contains ten three-color plates of different cherry species, numerous photographs of scenes along the Potomac, and the history and botany of the Park trees, together with a short account of the romance of the cherry blossoms, compiled by Mr. Yoshikawa from beautiful Japanese legends and poems. As the booklet proclaims, it is indeed one of the best souvenirs of the Capital.

### *The Pocono Mountains*

All those who have come to know and love the Poconos, give ear! To you Carroll B. Tyson has dedicated his book, *The Poconos,* and between its covers has enshrined the beauty, the lore and the charm of these northeastern Pennsylvania mountains. "There is an indefinable something about the Poconos that draws you to them —makes you want to stay or to go again and again until you have quite succumbed to their charm," writes the author. This same thing, in essence, has been written of other mountains and other parts of the world. Yet in this volume the author presents a strong brief in support of his declaration and his writing will find a welcome from many who share his affection for these hills and mountains. The publishers are Innes and Sons, Philadelphia.


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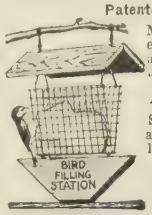


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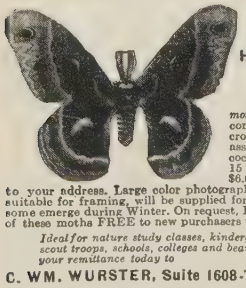

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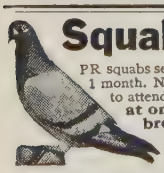

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### *Hamilton County Nature*

Indiana seems to be honeycombed with Nature lovers, and another outdoor group, the Hamilton County Nature Study Club, with headquarters at Noblesville, has just announced its program for the rest of the year. It involves doing many Nature-interesting things under the light of the different "moons"—the Planting Moon, the Rose Moon, the Hunting Moon and the rest. A bird calendar is being kept by each member, and each is requested to plant one tree a year. J. O. Clarke is President; Perry Bray, Vice-president, and Jean Clarke, Secretary-treasurer.

### *Dry Weather Appetites*

Dr. George Roberts, of Lake Forest, Illinois, reports an interesting observation regarding the appetites of robins for humanly distributed food during the past dry summer. More apples and grapes have been devoured by them than ever before, he relates, and they gobbled up the suet he puts out more quickly than usual. He believes the dry weather kept the worms from coming to the surface, and the birds did not get their usual diet.

### *Philadelphia Gardens*

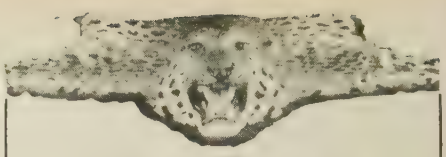
A volume of distinction for the library table is amply furnished in a beautiful de luxe publication of Dorrance and Company, Philadelphia, entitled *Portraits of Philadelphia Gardens*. This is the joint work of Louise and James Bush-Brown, the former director of the School of Horticulture for Women, and the latter a landscape architect. They have gathered together some fascinating pictures of some twenty-five outstanding gardens and they are produced together with attractive descriptive matter. The whole volume is a fine piece of work, also, from the printing point of view and the ensemble is a volume practical, beautiful and ornamental.

### *For the Dogs*

Will Judy, editor of Dog World Magazine and many articles and stories on dogs, has brought out a new edition of *Kennel Building and Plans* with new plans and theories for the comfortable housing of dogs, which will aid both the fancier and the one-dog man. After reading it, you will wonder why your dog ever stays with you at all, in the shack you have made for him out of a packing box. The price is $1, and the publisher, Judy Publishing Company, Chicago.

### *Jack and Jill*

Besides running an excellent Nature Study Department in the schools of Los Angeles, Dr. Charles Lincoln Edwards likes to write stories for young people, always, of course, with the Nature thread running through them. His most recent contribution along this line is *Jack and Jill and Indian John, a Chumash Chief*, and in this little story the youngsters learn a lot from John and it's great fun.

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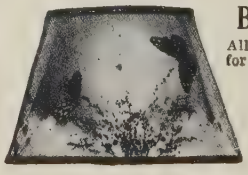

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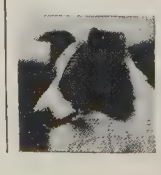

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## *The Bird Book*

In 1913, under the auspices of *The Farm Journal,* the late Wilmer Atkinson and Charles P. Shoffner started the Liberty Bell Bird Club, dedicated to saving our birds and involving nothing more than a pledge to do so. The success of this idea has been notable and nearly one million friends of the birds have enrolled. Having been so long and actively in this field, Mr. Shoffner has found that while there are many excellent bird books on the market, there is one method of handling that has been more or less overlooked. He, therefore, has essayed something rather different in his volume, *The Bird Book.* It is not a technical book but rather a volume to inspire and suggest. Each chapter is equipped at the end with interesting questions and answers, useful for the teacher, the parent and the youngster. We have never seen a bird book like this one and we feel that it is very much needed. The publisher, Richard Manson of New York, has priced the book low at two dollars.

## *Views on Evolution*

Here is a book that may have little sale in Arkansas, Tennessee and other points of like tendency. Mayhap we will even bring down censure upon our heads for being so bold as to review such a notable volume and to express the hope that it be widely read for the thought-stimulant it contains. The book is *Creation by Evolution.* Under the editorship of Frances Mason, with a foreword by Henry Fairfield Osborn and an introduction by Sir Charles S. Sherrington, twenty-four leading scientists have set forth in simple form their views on evolution and their reasons for their conclusions. The book is a forum in itself and a credit to the one who conceived it, Mrs. Mason, and to its publishers, The Macmillan Company. Its price is five dollars.

## *Fourth Grade Reader*

There seems to be a growing tendency among school readers, especially those adapted for the first four grades, to draw a major portion of the material from Nature literature. The Fourth Reader, in the series of the Rosary Readers, written by Sister Mary Henry and Sister Mary Arthur, and published by Ginn and Company, illustrates this tendency. Moreover, the Nature in the book appears to be unusually accurate, and the animal fiction stories not too heavily overdrawn. The poetry especially has been selected with great discrimination, and the prose, written by the compilers, is excellent.

## *Science Series Grows*

Book Four has now been added to the excellent series of science textbooks edited by Dr. Frank W. Ballou, published by D. Appleton and Company, New York, and appearing under the group title, *Elementary Science by Grades.* This latest volume is the combined work of Ellis C. Persing and Edward E. Wildman, and maintains the fine standard set by its predecessors in this series.


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### *Mr. Finley Lectures*

William L. Finley, American Nature Association lecturer, is looking forward to a busy season, and members of the association in different parts of the country will doubtless wish to know his appointments. In the December issue, the dates down to January 19 were given. Some time between January 20 and 25, Mr. Finley will be in Chicago, and thenceforth: Bowling Green, Ohio, January 27; Mishawaka, Ind., 28; Canton, Ohio, 29; Valparaiso, Ind., 30; Sewickley, Penna., February 3; New Wilmington, Penna., 4; Philadelphia, 7; Buffalo, N. Y., 8; Coatesville, Penna., 9; Montclair, N. J., 17; Pittsburgh, Penna., 19 and 20; Reading, Penna., 21; Memphis, Tenn., 26 and 27; Asheville, N. C., March 1; Buffalo, N. Y., 7; Detroit, Michigan, 11; Springfield, Ohio, 14; and Buffalo, N. Y., March 15. He will lecture in Boston, Mass., and vicinity between February 10 and 15 and March 3 and 8, but the definite dates are not yet set.

### *A Young Burroughs*

The impression of a none-too-quiet civilization upon the sensitive mind of Kimberley Johnson, 11-year old son of Mrs. Rhea Kimberley Johnson, author of *White Mice*, which appeared in January, 1929:

"I once lived on a road where one could find peace and God. They came with monsters made of steel and iron. They called them steam shovels and trucks. They cut down God's own trees and wiped out long strips of nature. They brought stuff called tar. They made what they called a road for smaller monsters to travel on. They call these automobiles. And now I live in hell!"

### *Wild Rose Lauded*

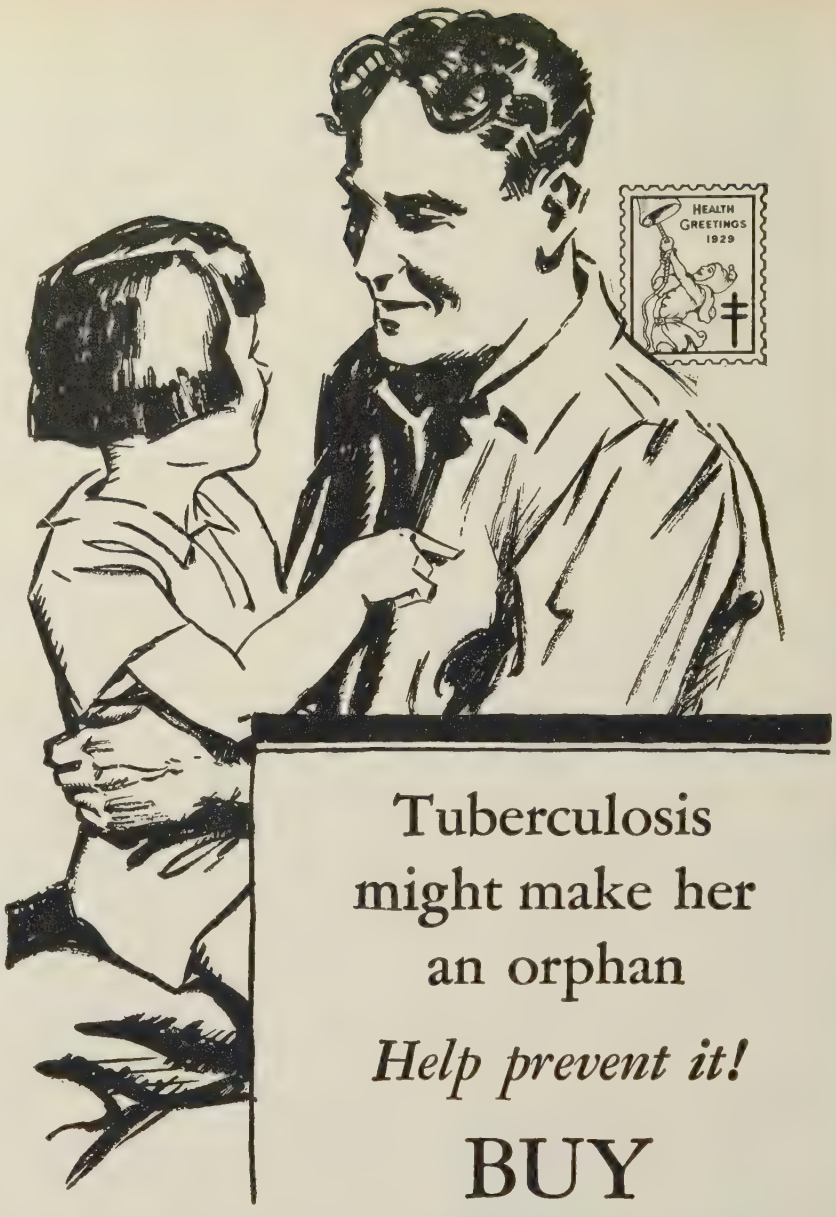
The leading candidate in the national flower campaign, the wild rose, has been favored with a song, entitled a "Song to a Flower", written by F. Avanarius Wirén, and sung by her over the radio on several occasions. Miss Wirén has been working steadfastly for her candidate through the voting period. The M. Page Music Publishing Company, 220 West 42nd Street, is the publisher.

### *Praying Mantis Preys*

One morning a commotion was heard in the back yard of the house of Charles E. Graves at McKinney, Texas, and the crowd of children responding to it, found a hummingbird limp and exhausted in the toils of a praying mantis. He was being held about the neck just back of the head. Evidently, he had come too close to a zinnia upon which the mantis was resting, and had been attacked. After the victim had been released, he recovered, but kept away from the zinnias. This is a most unusual example of insect and bird conflict.

### *Exchanges Wanted*

Miss Florida Rivard, of Route 8, Yakima, Washington, is looking for the opportunity to make exchanges with botany students in foreign countries and in other sections of the United States and Canada for the purposes of making a notebook. She prefers to exchange pressed leaves and flowers.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### *A Steady Caller*

A whip-poor-will who returned to the vicinity of the home of F. C. Penfield at Topeka, Kansas, for four successive seasons, on his way south is reported by Mr. Penfield. It was October 1, 1926, that he made his first call, and when found was snuggled down asleep on the porch railing. In 1927 he chose the same spot, the same time, and the same position; but in 1928, he perched on the top rail of the next door neighbor's grape arbor. This year, again on October 1, he was back in the first chosen place. Each time he remained until four or five o'clock before continuing on his way south. The bird was identified by certain characteristic marks.

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### *Flower Protection*

Measures, too long coming, to preserve some of the fast disappearing native flowers of southern California have been adopted by the counties of Los Angeles, Riverside, Imperial, San Diego and San Bernardino by the enactment of ordinances. Each of these make the picking of certain plants a misdemeanor, punishable by fine or imprisonment, or both, and will have considerable effect throughout the state. While such ordinances are necessary, of course, yet the difficulties in enforcing them are almost insuperable, and the complementary educational campaigns such as conducted by the Nature Club of Southern California are necessary. It is not enough to say, "don't", and "mustn't touch"; individuals must be inculcated with such love for flowers and such respect for the rights of others as to be content to look, and then pass on.

### *Real Protection*

Among the Nature organizations which are working not for organization but for the establishment of better safeguards for wild life and flora is the LaRue Homes Nature Lovers' League, the president of which was the late Waldron DeWitt Miller, of the American Museum of Natural History. It has been the supporter and instigator of a number of conservation bills in New Jersey, its home state, and has done active duty in the schools to promote wild flower preservation, issuing pamphlets, bulletins, "honor" cards for classes that have not picked wild flowers for a year, and other literature on conservation. Its president was, before his death, a recognized conservationist with none of the conventional compromises in his system.

### *Birds and Wires*

That power companies are as anxious as bird lovers that birds keep off their cross-country lines is not generally known, but is true. Short-circuits not only kill the bird, but cause expensive breakdowns in the line. Steps have been taken abroad to further insulate the conductors, and undoubtedly these plans will be followed in this country. The slogan for this campaign will be: "Save the Birds and the Current!"

### *Planting Shelters*

Rural communities suffer greatly during the winter, especially on the plains, from snow which fills their roads and prevents transportation not only from town to town, but from neighbor to neighbor. The U. S. Department of Agriculture has issued a bulletin, *Planting and Care of Shelter Belts on the Northern Great Plains*, which may be of use to farmers and orchardists. It appears as Farmers' Bulletin No. 1603.

### *New League Manager*

Mr. M. K. Reckord of Washington, D. C. has been appointed the General Manager of the Izaak Walton League of America, to succeed the late Fred H. Doellner. He was formerly on the National Staff of the American Red Cross, being director of activities in the West Indies, and of the First Aid and Life Saving Service.

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## THE NATIONAL FLOWER VOTE

Owing to a heavy poll during the past few weeks, and to reports from all over the country that organized campaigns could not get out the vote completely before December had begun, it was agreed to allow votes to come in until January 1, instead of December 1, as previously announced. The American Nature Association will announce the people's choice in the March issue of Nature Magazine.

The totals to date of closing the magazine are as follows:

| | |
|---|---|
| Wild Rose | 404,025 |
| Columbine | 165,773 |
| Goldenrod | 72,961 |
| Violet | 88,187 |
| Phlox | 30,132 |
| Daisy | 16,202 |
| Dogwood | 7,911 |
| American Beauty Rose | 21,044 |
| Mountain Laurel | 11,672 |
| Scattering | 28,367 |
| Total | 846,274 |

### *Kentucky Botanic Gardens*

The botanic gardens of the University of Kentucky are nearly completed, after a year of active work, Harry Lindberg, the landscape gardener reports. The plot is divided into three parts, with rock garden, garden for plants needing special soil, and a plot for native trees and shrubs. It is hoped to contain ultimately every type of plant which will grow in the climate.


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The American Tree Association stands for a constructive policy of forest protection and extension, to increase appreciation of forests as natural resources essential to the sound economic future of the country.

The Association directs encouragement of tree planting by the public; disseminates popular forestry news for the information of editors of the daily press; and compiles and distributes forestry news and reports on legislative progress for assistance of active foresters in the field.

# The American Tree Association

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*Educational Director*

## "THE THIRTY-THIRD HUNDRED THOUSAND"

### Distribution of Forestry Primer Reaches a Remarkable Peak Due to Interest of Educators in this Important Subject. This Educational Work Insures Next Generation Will be Forestry-minded.

IN looking back over the year in forestry education it can be said that the message is gathering momentum every day. The Forestry Primer, published by the American Tree Association, has now reached the tremendous total of three million, three hundred thousand copies, so great has been the demand for it on the part of educators throughout the country. Commenting upon this remarkable distribution, the New York Times said:—

"Printing of the thirty-third hundred thousand copies of 'The Forestry Primer' last week, in response to the demands of school teachers for the booklet, is an indication of the growing interest of school children in trees. This enormous number of copies has been distributed by the president of the American Tree Association Mr. Charles Lathrop Pack, since 1926.

"It is no mere coincidence that the demand for the pamphlet, which describes in simple terms the forestry problems of the country, has kept pace with interest in conservation. All such efforts to disseminate information—especially in the schools—has a cumulative effect.

"For example, New York State is now beginning actively to interest the children of the public schools in the planting and care of trees. If this movement once gets well started, so that children may not only plant but tend the trees which they have planted and watch them grow, the bases of a practical attitude toward conservation will have been firmly laid. The school children of today will thus be able in time to undo the damage caused by the wastefulness of the grown-ups of yesterday."

Not only are the schools using this booklet but hundreds of copies have gone to women's clubs, scout organizations, business associations that have the subject up for discussion. City, county and state groups are reading up on the subject. One of the big meetings of the future will be the Southern Forestry Congress at Memphis during the week of April 6. Coincident with this meeting plans are being made to hold the session of the sixteen southern governors so the forestry question can be put before them at the same time.

That conservation will be uppermost in the public mind is shown in the appointment of twelve members of President Hoover's commission on conservation and administration of the public domain, with a statement giving the scope of the commission's inquiry. All the public land states will be represented. In addition to the chairman, James E. Garfield, Secretary of the Interior in the Roosevelt administration, the commission will include four representing the country at large. These are George Horace Lorimer, editor of Saturday Evening Post; James P. Goodrich, former Governor of Indiana; W. B. Greeley, formerly head of the Forest Service, and Gardner Cowles, Des Moines, Iowa, newspaper publisher. President Hoover said Secretaries Wilbur and Hyde would serve ex officio, because both the Interior and Agriculture Departments would be interested in the inquiry.

Members of the commission representing public domain states who already have accepted the President's invitation are as follows: Elwood Mead, Director of the Reclamation Service, to represent California; I. M. Brandjord, Montana, Commissioner of State Lands and Investments; R. K. Tiffany, Washington State, Superintendent of Hydraulics and Reclamation; Rudolph Koechler, Arizona president of the Arizona Taxpayers' Association; Charles J Moynihan, Colorado, an attorney specializing in land office and forestry cases; George W. Malone, Nevada, State Engineer; William Peterson, Utah, geologist with the State Agricultural College of Utah; I. H. Nash, Idaho, State Land Commissioner. President Hoover has received a committee which laid before him the importance of the forestry problem.

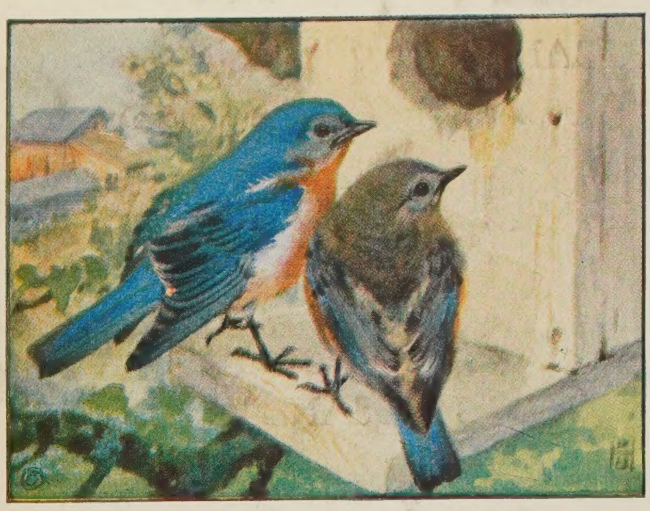
Tree planting is going forward slowly but not on anywhere near the scale that it should. Nearly 29,000,000 forest trees were distributed under the Clarke-McNary Act by states and territories for farm planting. Under this act the states and territories co-operate with the Federal Government in growing and distributing forest nursery stock. In 1928 thirty-four states, Hawaii, and Porto Rico were co-operating with the Federal Government in the tree distribution project. Planting stock grown in state nurseries was distributed by most of the states at cost. A few states distributed stock free to farmers for timber growing purposes.

The co-operating states furnished a total of 68,565,291 trees for planting. Of these 28,757,448 were distributed to farmers under the Clarke-McNary co-operation plan, 18,330,141 were distributed for planting on private lands other than farms, and 21,477,702 were provided for planting on state lands.

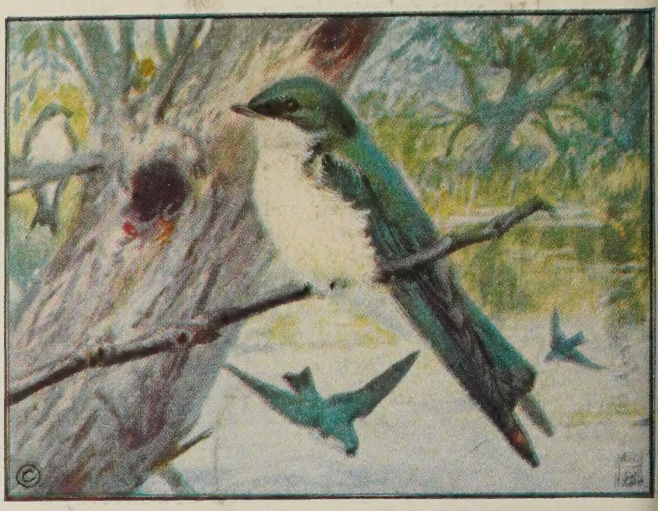
Most of the planting stock furnished to farmers during the year was for the purpose of timber growing on farm woodlands, although several states distributed trees for the development of shelter belts and windbreaks. In distribution to farmers, New York led with 9,840,000 trees and Pennsylvania was a close second with 9,062,396. Other leading states were Ohio, 1,528,200; Massachusetts, 1,139,700; Vermont, 862,500; and New Jersey, 783,000. West Virginia and Florida are operating forest nurseries under agreement with the Federal Government, but they had not been in operation long enough to produce planting stock for distribution

That the educational work must go on and that the planting is nowhere near what it should be is shown in the figures just made public on the production of lumber, lath and shingles for 1928. They follow: Lumber 34,142,123 thousand feet, board measure, a decrease of 1.1 per cent as compared with 34,532,420 thousand feet in 1927; lath, 1,903,859 thousand, a decrease of 19.7 per cent as compared with 2,372,333 thousand in 1927; and shingles, 5,603,690 thousand, a decrease of 13 per cent as compared with 6,443,868 thousand in 1927.

These tremendous figures show the need of putting to work millions of acres of our idle land fit for nothing but growing trees. The future economic independence of the nation depends upon this. Every time you get some one to read the Forestry Primer you are helping to make the nation "forestry minded."



BLUEBIRD—*Sialia sialis*



TREE SWALLOW—*Iridoprocne bicolor*

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